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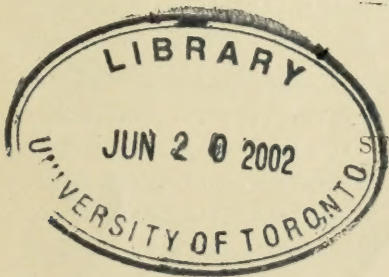
THE
AMERICAN JOURNAL
OF
OPHTHALMOLOGY

INDEX TO VOL. XXI.

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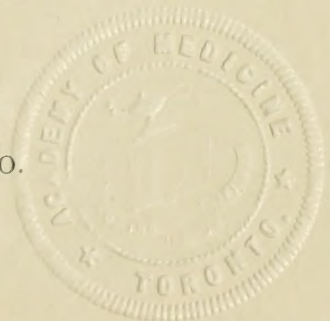
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ADOLF ALT, M. D.



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THE AMERICAN JOURNAL OF OPHTHALMOLOGY.

VOL. XXI.

JANUARY, 1904.

No. 1.

ORIGINAL ARTICLES.

THE ONE-HAND METHOD OF TESTING THE TENSION OF THE EYE.

By DR. C. S. AYRES,

CINCINNATI.

THE testing of the normal and abnormal tension of the eye is an every day necessity in the duties of an oculist. Many conditions require it. Cases of glaucoma, cyclitis, choroïditis, iritis and injuries of many kinds call for a test of the tension. Staphylomatous as well as shrunken eyes are likely to have abnormal tension, and this point must be definitely known. Cases which are plain or well or obscure ones demand this point to be settled almost in advance of other conditions more important. We must differentiate in almost any case of intraocular disease between a normal and abnormal tension. The method of testing this question is, according to text-books, to press the index fingers of the two hands upon the closed lids of the eye under consideration, and then by alternate pressure determine whether there is any deviation from what is known as normal tension. The fingers are placed on the ball and the patient directed to look down and then the pressure is made on the lids as in palpation for fluctuation. Instruments for this purpose have been devised but they are of little value for every day work. The finger test is the best, and the *tactus eruditus* is acquired after some practice. For a good many years I have been using the in-

dex and middle fingers of one hand in preference to the method above stated.

I think I have a more delicate sense of touch in one hand than I have in two. The method is as follows: The patient is directed to close the lids gently and look down. The two fingers are then placed on the eyelid and pushed up against the rim of the orbit, the finger nails resting against it. Then alternate pressure is made over the ball. A more delicate sense of variation from the normal tension can be detected in this way than by the ordinary method. I usually stand on the left side of the patient and use my left hand by preference, but can use either.

One of the advantages of this method is that in making the test the arm is free and at rest. It is particularly useful when examining a patient lying in bed. Here one has to lean over sometimes in a very uncomfortable position, and the arms are bent at right angles and elevated from the body. In making an examination under these circumstances, with two hands, and even while standing and when the patient is sitting, the index fingers are not parallel and point somewhat toward each other. In the one-hand method the fingers are close together and parallel to each other and in their normal position. In my judgment we derive a more delicate tactile sense from the two fingers which are next to each other than we do from the index fingers of the two hands placed side by side.

More accurate ideas of the tension are more quickly acquired with much more comfort to the patient and to the surgeon by the one-hand method.

PAMPHLETS RECEIVED.

"Cytotoxins and Sympathetic Ophthalmia," by B. Pusey, M.D.

"An Old-Time Quack Eye Doctor, the Chevalier, John Taylor," by B. Pusey, M.D.

"Retinal Rosette Formations of Neuroglia in Inflammatory Processes," by B. Pusey, M.D.

"Bacteria in the Eye and Notes on Some Recent Work in Ophthalmologic Bacteriology," by B. Pusey, M.D.

TWO CASES OF SYPHILOMA OF THE CILIARY BODY.

CLINICAL HISTORIES.

BY DR. CH. J. KIPP,

NEWARK, N. J.

Microscopical Examinations and Remarks.

BY ADOLF ALT, M.D.

THE parts of two eye balls, to which the following will apply, have been in my hands for a number of months, but for lack of space I have been thus far unable to describe them. The recent monograph on the syphiloma of the ciliary body by Ewetzky* prompts me the more to do this, since, after weeding out the doubtful cases, this careful compiler has been able to make use of only 67 undoubted cases, only 23 of which had been enucleated. Of these 23 a number had evidently been insufficiently examined. A few cases have since been reported which were not included in Ewetzky's monograph, the last one by F. Tooke, (*Monatsbl. f. Augenhlk. Beilageheft*, 1903), who, also, found 22 cases previously reported in literature. Tooke's case and illustration are almost the same as the first one of my two new cases.

It is not unlikely that the number of microscopically examined cases represents very nearly the actual number of eyes enucleated on account of syphiloma of the ciliary body. The clinical observations, on the other hand, have undoubtedly been much more numerous than would appear from the published literature. I have myself seen a number of cases in clinical work which I did not deem of sufficient interest to report, and the same probably holds good for a great many clinical workers. Nor is it always possible, from a clinical standpoint alone, to make sure whether we have to deal with a real gumma of the ciliary body, or whether the tumor started further back in the choroid, as I thought in at least two cases which I observed and which led to a rupture of the sclerotic behind the aequator and subsequent phthisis of the eyeball.

Some authors have doubted the correctness of the diagnosis in cases in which a comparatively short period had

*Ueber das Syphilom des Ciliarkoerpers. Prof. Dr. Th. von Ewetzky. S. Karger, Berlin, 1904.

passed between the infection and the appearance of a tumor in the ciliary body. We know, however, that syphilis is far from acting according to rule, so to speak, and that as we find precocious affections of the nerves, for instance, the optic nerve, we may also have precocious gummata. Histologically there is such a uniformity in the findings of the different authors that there can hardly be any doubt but what the diagnoses are correct. As a rule, eyes affected with a syphiloma of the ciliary body have come into the hands of the microscopists at a comparatively late stage of the disease, when perforation of the cornea or sclerotic or both had taken place and the pain had driven the patient to consent to the removal of the eyeball. It is therefore not astonishing that in almost all of the published cases the syphiloma involved a large extent of the ciliary body. This fact led Ewetzky to state that the syphiloma of the ciliary body always forms a more or less complete ring. He goes on to say: "With this I do not at all intend to deny the *circumscript* type of the syphiloma, as described in the cases of Alt and Coppez, but I must state that these cases are not convincing to myself, since these authors did not examine their cases in series of sections. At least they do not so state."

As concerns the case of Coppez I have nothing to say, as this author can surely answer for himself. In my own case (*Knapp's Archives of Ophth.*, Vol. vi., p. 318) I have made numerous sections through the eye and still possess a number of them. That the tumor was an isolated one and not a ring-shaped or partly ring-shaped one, I can still prove by these sections. What it might have been later on is not the question, but it seems to me not at all unreasonable to assume that a syphiloma in the ciliary body, as well as elsewhere, does not begin, so to speak, full grown, but rather as a very small nodule, which only gradually increases in size as it involves the neighboring tissues. Figure 1 is a photograph made from one of these old sections, nearly through the center of this small tumor. It has lost its stain and therefore shows but little detail. It shows, also, that while the eye was otherwise gravely diseased, the tumor had not yet broken through inwardly or outwardly.

The following is Dr. Kipp's history of

CASE I.—“S. P., aged 22, a slender but well developed man who has only recently come to this country from Italy, was first seen on May 14, 1903. His right eye was normal, $V = \frac{6}{5}$. His left eye was almost blind. There was only perception of light. The lids were normal. The movements of the globe were unimpeded in all directions. The ocular conjunctiva was intensely injected and slightly raised by effusion. The cornea was hazy and the epithelium was rough and uneven. The an-



FIG. 1.

terior chamber appeared of normal dimensions, and its outer half was filled with a yellowish mass, like a fibrinous exudation. Only the inner half of the iris was visible. This was swollen and discolored. The pupil was closed. He was suffering great pain in the eye. All that I could learn of the previous history of the case was that he was otherwise in good health, and that the eye had been red and painful *five days* before he came to me. He denied having had syphilis.

The case was looked upon as one of irido-cyclitis. Atropine and cocaine were instilled at short intervals. Warm fomentations were applied several hours daily; six leeches were ap-

plied to the temple and the salicylate of sodium was given internally.

May 16.—The only visible change is a slight dilatation of the inner half of the pupil.

May 19.—The patient is now in the City Hospital. There is now some bulging of the sclera adjoining the outer margin of the cornea, and at about 2 mm. outwards of the outer corneal margin in the horizontal meridian there is now a dark colored spot about the size of a pin head; T+1. He has intense pain in the eye.

May 21.—Increased bulging of the sclera; the dark colored spot has increased to the size of a lentil, and another small spot has made its appearance about 2 mm. above the first one. In the cornea adjoining the bulged portion of the sclera there is now an infiltration of crescent shape apparently in the deepest layers.

May 24.—The bulging of the sclera has extended above and below and is increased in height. Both the dark colored spots have increased in all dimensions, and the two are connected by a ridge of raised conjunctiva. The cornea is more hazy; the anterior chamber contains blood in addition to the yellow mass. Believing that I had to deal with an intraocular growth, I enucleated the globe. During the operation a drop of clear fluid escaped from the larger darkened colored protrusion in the sclera. The wound healed in a few days."

In a letter dated May 31, 1903, referring to this eye, Dr. Kipp says: "I have just learned through a competent interpreter that the Italian whose eye I sent to you had a sore on the penis three years ago, for which he was treated with mercurial inunctions. *No secondary symptoms developed.* Six months ago he underwent another course of inunctions, not because he had any particular ailment, but because he thought that he could thereby prevent the usual consequences of syphilis. I also learned that his mother died of a malignant tumor of the abdomen."

Macroscopic Inspection.—The conjunctiva is swollen and very hyperemic, especially near the part where a mass of tissue has penetrated the corneo-scleral tissue and spread to some extent outside of it. This tissue is in direct connection with the enormously swollen ciliary body and replaces the

iris on this side, in meridional sections. The new formed tissue stretches across where the pupil should be and is attached to the iris on the other side. The anterior chamber is filled with a coagulated substance. The lens is pressed down and inward by the swollen ciliary body and its capsule is ruptured. The optic nerve is atrophied. (Fig. 2.)

Microscopic Examination.—The tumor of the ciliary body starts at the beginning of the pars non plicata and reaches forward into the iris which has lost its characteristics. At the corneoscleral margin the tumor has broken through the



FIG. 2.

hard membranes and expanded to some extent outside of the site of the perforation under the conjunctiva. It consists altogether of small round cells, mostly mononuclear, a smaller number being of the polymorphonuclear kind. There are a number of small necrotic areas here and there. A few stellate pigmented cells are enclosed between the round cells. The tumor proper contains but few blood vessels. The pigment epithelial layer in the pars non plicata is broader than normal and its cells are beginning to break up. In the pars plicata the pigment epithelium cells have yielded altogether to the pressure, their pigment is free and the boundary line which they formed is broken through by the cells of

the tumor which extends somewhat into the vitreous space. Pigment granules are again encountered in the extra ocular part of the tumor, where pigmentation had been clinically observed. The cells of the tumor, have infiltrated the cornea and sclera in the neighborhood of the perforation and spread into the iris which can only be recognized as such by a line of free pigment granules, the remnants of its retinal layers. I have not been able to find either epitheloid or giant cells anywhere in this tumor.

The contents of the anterior chamber are blood, coagulated fibrine and some tumor cells. Tumor cells and fibrine lie also in the vitreous body behind the lens. The lens is pushed to one side and backwards, and it is smaller than normal. Where its aequator is in contact with the tumor the folded lens capsule is firmly adherent to this. Anteriorly to this, the capsule is ruptured and tumor cells have crept in between the disintegrating lens fibres.

The iris, the part of the ciliary body which is not involved in the tumor, and the choroid are, also, densely infiltrated with round cells and very hyperæmic. The retina is detached and shows small cell infiltration in the nerve fibre layer.

On account of the dense cell infiltration in all the parts affected it is not possible to recognize any changes in the blood vessel walls.

The history, as well as the histological conditions leave no doubt in my mind as to the true nature of this tumor which I do not hesitate to consider a syphiloma of the ciliary body. This particular syphiloma was old enough to have invaded quite a large part of the ciliary body and thus it forms a part of a ring.

The following is Dr. Kipp's history of

CASE II.—“N. K. S., an American, 49 years of age, was brought to my office by his physician in June, 1891. The doctor told me that the man was under his treatment for syphilis and that his eyes had been inflamed for a week or more. I found that his left eye was normal in appearance and V = 60. The right eye was deeply injected, but there was no chemosis. The cornea was hazy, and Descemet's membrane was the seat of a dense deposit of whitish particles. The iris was discolored and swollen. The pupil contracted and ex-

cluded. He had good perception of light. I advised continuation of the mercurial treatment and atropin solution and warm applications to the eye. The patient did not return to me till six weeks later, when I found the eye worse in every respect. There was now, also, a hypopyon and the iris was covered by a thick, yellowish exudation. The mercury was continued. He returned a month after this last visit with the statement that he could not endure the pain any longer, and that his family had advised him to have the eye removed. At this visit I found in addition to the intense injection of the entire globe extensive chemosis. There were now in the sclera, a few mm. from the outer margin of the cornea, several small black nodules raised a mm. above the level of this membrane. The cornea was so hazy that the iris could scarcely be seen. The anterior chamber was obliterated. The pupil closed. There was only faint perception of light and the tension was markedly increased. I yielded to his entreaties and enucleated the globe on the following day. The wound healed without reaction. Since then the patient has been in good health. He has now no manifestation of syphilis."

The half of this eyeball which Dr. Kipp sent me was not very well preserved and was soft in consequence. It was not possible to make very fine sections and its tissues did not take up the stains very well, although sufficiently well for examination.

Macroscopic Inspection.—A tumor occupies the site of the ciliary body, starting backwards in the pars non plicata and reaching forward to a place of perforation in the corneoscleral region. A faint dark line shows that the iris periphery was here forced outward into the channel of the perforation so that its pupillary edge lies close to the posterior surface of the cornea. The ciliary body diametrically opposite to the tumor, in meridional sections, is atrophied but covered on its inner surface by tumor tissue in which the iris is also imbedded. The whole of the anterior chamber is filled with a tissue the nature of which is not recognized on macroscopic inspection (Fig. 3).

Microscopic Examination:

The tumor of the ciliary body has not only perforated outwardly through the corneoscleral tissue but also broken

through the pigment epithelium layer of the pars plicata toward the interior of the eyeball. It has taken up the iris so that, but for a faint remnant of pigment granules, it can no longer be recognized. The pigmented parenchyma cells of the ciliary body have all disappeared. The pigment epithelium cells have been destroyed, but their pigment lies as yet free between the tumor cells in such a manner as to show the inner limit of the ciliary body. The tumor itself consists of closely packed small mononuclear and polymorphonuclear cells which in several large patches are necrotic. Where the tumor has broken through the hard membranes



FIG. 3.

its cells have infiltrated the adjacent sclerotic and cornea and the tumor has spread mushroom-like under the very hyperemic and densely infiltrated conjunctiva. There are neither epithelioid nor giant cells. The tumor is in places quite vascular. Tumor cells stretch in meridional sections from one ciliary body to the other, like a cyclitic membrane and cover the inner surface of the ciliary body opposite the tumor as a thick mass. This part of the ciliary body appears compressed and uninfiltrated by round cells, although the choroid farther back shows considerable cell infiltration. The iris on both sides of such sections is replaced by tumor tissue and only recognized by the remnants of its pigment.

The anterior chamber is filled by the remnants of the crystalline lens. The lens capsule has evidently been ruptured in a number of places, and shreds of it are seen here and there in the mass of broken up lens fibres and tumor cells. The lens remnants look exactly as they do after a dissection of the lens capsule or in a case of traumatic cataract, soon after the occurrence of the injury.

There is a general infiltration of round cells in the choroid. The retina is detached and atrophic.

The similarity of these two tumors with others, described in literature, as well their history, does not allow of any doubt as to their true nature as syphilomata of the ciliary body. The second case was, also, of sufficiently long standing to allow the tumor to have spread in the ciliary body to some extent and to have assumed the shape of part of a ring.

The destruction of the lens capsule, which has been found in these two cases, seems to be rather characteristic of syphiloma of the ciliary body and has been observed whenever the tumor was of sufficiently long standing and size to influence the lens tissue directly.

PAMPLETS RECEIVED.

“A Single Disc Eye Mirror,” by H. Knapp, M.D.

“A Few Personal Recollections of Helmholtz,” by H. Knapp, M.D.

“The Treatment of Keratoconus With Galvanocautery,” by H. Knapp, M.D.

“The Symmetry of Our Visual Apparatus as a Dual Organ,” by H. Knapp, M.D.

“On Hypertrophy and Degeneration of the Meibomian Glands,” by H. Knapp, M.D.

“A Point in Dioptries of Astigmatic Refraction Illustrated by a New Model,” by H. Knapp, M.D.

“Landmarks in the History of Ophthalmology in the Nineteenth Century,” by H. Knapp, M.D.

“Transactions of the National Association of United States Pension Examining Surgeons, 1903.”

MEDICAL SOCIETIES.

PROCEEDINGS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.*

JOHN TWEEDY P.R.C.S., President, in the Chair.

Thursday, October 29th, 1903.

THE PRESIDENT delivered his opening address, in which he briefly sketched the history of the Society. He drew attention to several of the past presidents, and made feeling allusion to the recent death of one of the oldest members of the Society, Mr. GEORGE LAWSON.

TUMOR OF THE CHOROID.

This case was related by Mr. NETTLESHIP.

The patient was a female, aged 24, who had lost the use of the right eye. The eye was quite blind and in a condition of absolute glaucoma. The eye was removed by Mr. Nettleship in 1894, and when last heard of six years later the patient was in good health. There was a doubtful history of tuberculosis in the family. The vision of the eye was defective when the patient was 15 years of age from detachment of the retina. There was a bulging in the ciliary region, and as the eye was painful it was removed. There was a large staphyloma near the ciliary region on the outer side, and corresponding to it internally there was an angiomatous sarcoma; the cells were round and oval, and it was somewhat pigmented. This was surrounded by a stratum consisting of fibrous tissue in which there was much cholesterol. The optic nerve was atrophied and there were one or two outlying nodules. Probably hæmorrhage was the origin.

Mr. J. H. PARSONS thought the case was almost unique. Fuchs and Leber had collected cases associated with shrunken globes and definite cyclitic changes. He thought the condition suggestive of necrosis of the sarcoma.

*British Medical Journal.

TUMOR OF THE CHOROID.

MR. J. H. FISHER described this case:

The patient was a woman, aged 52, whose left eye he had excised in October, 1902; six years before there was a cataract with detachment of the retina, ascribed to a blow. The eye was removed on account of pain. A small vascular spindle-celled growth was found near the entrance of the optic nerve. It was pigmented and hæmorrhagic and showed some signs of necrosis. A column of sarcoma cells could be traced along one of the posterior ciliary nerves.

The speaker discussed the possible transmission of material from one eye to the other as in those doubtful cases where sympathetic disease had been said to follow similar conditions.

TOBACCO AMBLYOPIA.

MAJOR F. O'KINEALY describes this case:

The patient was an Irishman, aged 42, with a specific history. He had lived in India nearly all his life and was a clerk. He had been a very heavy smoker, accounting for as many as 500 Burmah cheroots per month of the cheap and rank variety. The vision was only $\frac{4}{60}$ and J. 18. There was a central defect in both eyes and a limitation of the fields of vision for white. There were several irregular-shaped scotomata situated about the field of vision. Tobacco and alcohol were cut off, and strychnine and iron were given with pilocarpin. Four months later the vision was restored to $\frac{6}{6}$ and J. 1 with glass, though the fields were even more contracted and the multiple scotomata had run together into a complete ring; color perception was still defective.

The speaker also cited another patient, a Eurasian, whose vision was from the same cause reduced to J. 18 with loss of fields for red and green and yellow, in two months he improved to $\frac{6}{9}$ and J. 1. The scotomata disappeared and color vision returned.

MR. LANG referred to a statement made by Wingrave that he had observed a corresponding defect in hearing in patients suffering from tobacco amblyopia which, with the vision, had improved after giving up tobacco.

MR. NETTLESHIP commented on the unusual occurrence of a further reduction of fields while the vision was improving.

MR. HOLMES SPICER thought that a syphilitic retinitis might have had something to do with both cases, but Major O'Kinealy said that there was not the slightest evidence of this condition being present.

MR. JOHNSON TAYLOR said he had never seen deafness associated with tobacco amblyopia.

THE ANATOMY OF THE PLAQUES IN XEROSIS.

MR. MAYOU described this condition, drawing his observations from six typical cases. The plaques were situated on either side of the cornea and covered with bubbles of Meibomian secretion. The xerosis bacillus was found in five of the cases. Sections show that they adhered only to the surface and did not penetrate. He gave his reasons for not considering these the cause of the disease. The changes in the epithelium were those due to exposure, and the superficial layer showed a well-marked layer of keratin on the surface. Beneath this was a layer of keratohyalin. There was a complete absence of cells showing mucoid degeneration. Mr. Mayou thought that the mucin cells were one of the most important factors in bringing about hydration in the normal conjunctiva, and that therefore the essential change was keratinization of the epithelium, due partly to exposure and partly to deficient lachrymal secretion occurring in children of delicate health, and that the Meibomian secretion and organisms were simply adherent to the plaques owing to the altered surface tension due to keratinization of the epithelium and the absence of mucoid changes therein.

MAJOR HERBERT said that he had observed similar changes in other mucus membranes. He attributed these bad cases of xerosis to an absence of the mucoid cells in the lining epithelium.

CARD SPECIMENS.

MR. C. H. Goldsmith: A case of retinitis proliferans.
MR. W. Adams Frost: A demonstrating ophthalmoscope.
MR. R. W. Doyne: A case of varicose retinal veins with thrombosis. Messrs. Doyne and S. Stephenson: A case of retinitis circinata. MR. W. H. Jessop: A case of proptosis.

JOHN TWEEDY, P. R. C. S., President, in the Chair.

Thursday, November 19th, 1903.

CASE OF INDIRECT GUNSHOT INJURY OF EYE; MICROSCOPICAL EXAMINATION.

This case was read by MR. NETTLESHIP. The patient was a man, aged 19, who in July, 1897, held a pistol to each temple and fired. He was brought to the hospital bleeding from a wound in the right temple. The skin was singed and the bullet wound passed through the orbit into the ethmoid. In the left temple was a bullet wound into which a probe could be passed two or three inches. There was perception of light in the right eye, but not in the left. Nine days later the right fundus showed hæmorrhages in various parts of the fundus. In the left no details were visible. Twenty-nine days later the right disc was very pale, and there were several ruptures of the choroid. The left was not so well seen. Thirty-one days after the accident he was X-rayed, this being in very early days of that work. It was thought that two bullets were seen in the skull, but this was found afterwards to be an error. On the thirty-sixth day after the injury convulsions developed and patient died comatose. Post-mortem examination showed that there was no bullet in the skull. There was meningitis of the base and vertex. Only the pistol fired on the left side took effect, the right probably having had a blank charge in it. The back of the eyes were removed for examination, and Mr. Nettleship gave a lantern demonstration and showed photographs of the condition found on microscopical examination. The point of interest was that although the bullet had caused so much injury to the choroid, yet this was only indirect, as it had not passed near enough to the eye to touch it, and there was no rupture or perforating injury of the sclerotic.

The President mentioned a somewhat similar case that had come under his own observation.

AN EASY OPERATION FOR ECTROPION.

DR. FREELAND FERGUS described the operation he had found very useful for ectropion following certain cases of blepharitis. He considered the usual methods with caustics unsatisfactory. The operation he described consisted of dissecting the conjunctiva well away from the underlying tissue

and removing the hypertrophied tissue thoroughly; on this latter point depended the success of the operation. He considered that Snellen's sutures produced but little effect if they were kept aseptic.

AVERAGE VISUAL ACUTENESS.

DR. FREELAND FERGUS also read a paper on this subject. He seriously called in question whether the $\frac{6}{6}$ of Snellen's types was the average vision of the majority of people. He thought that the average was nothing like so high if patients were taken without the correction of their refractive error, and that for medico-legal questions the average without correction should be taken. He suggested that a committee should be formed to investigate this. They might at the same time investigate the question of color vision, as he considered that color blindness was not in any way dangerous to navigators or seamen if their light sense were normal.

MR. DEVEREUX MARSHALL said that he was surprised that color blindness should be considered of so little importance to those engaged in navigation, and if there were any who doubted the extreme inadvisability of allowing color-blind men to take responsible positions on board ship a committee should certainly be formed to settle the matter.

The President said that although he quite agreed as to the importance of the light sense being perfect, yet he by no means thought that color-blind people should be allowed to take charge of ships.

MESSRS. SECKER WALKER and ROLL discussed the operation for entropion, and Dr. Freeland Fergus in reply said that he considered color blindness of no disadvantage to seamen; or, if their light sense was perfect, they would never confuse the side lights. He thought it entailed much hardship on men who were perhaps rejected from the extra master certificate for color blindness when they had perhaps served many years at sea without any accident having occurred in consequence of their defect or any evidence that they confused the navigation lights.

THE JUDGMENT OF THE SIZE OF DISTANT OBJECTS.

MR. N. BISHOP HARMAN in his paper on this subject referred to a note in the *British Medical Journal* of September 12th, 1903, wherein a writer drew attention to an experiment

in which, by an illusion, the experimenter was led to believe objects seen were smaller and more distant than they were known to be; this had been attributed to the influence of accommodation. Mr. Harman pointed out that these facts were true and well known. He showed by several simple experiments with prisms and stereoscopic views that objects could be made to appear either small or large at will, and that this illusion was due to the state of balance of the extraocular muscles. The unconscious cerebration led one to suppose that objects of a given size appeared, when seen under unnatural conditions of convergence, smaller and more distinct, but that when seen under unnatural divergence they seemed larger and nearer than they were known to be. Mr. Harman showed that in the progression of the vertebrates, increase of visual acuity was coincident with the moving of the eyes from a primitive lateral position of the head to a forward position, in which the visual axes could approximate a normal parallelism; the change was complete in man and with him perception of space was probably most perfect. Coincident with these changes was a specialization of the superior oblique muscle. Mr. Harman pointed out that in the plaice almost the whole of this slow progression had been anticipated at a bound. They elected to live a life resting on one side, and they appeared to depend above all other fish on the acuity of their eyes, both of which were turned upwards on the exposed uppermost side, and were, he thought, capable of some degree of parallelism of visual axes. In these fish he had found the same special features of the superior oblique muscles which characterized the higher vertebrates; it was not found in any other fish. He believed that the steady progression of the vertebrates towards binocular vision indicated the pre-eminent importance of extraocular muscle balance in the factors which went to form our judgment of time and space.

CARD SPECIMENS.

MR. G. W. ROLL: A case presenting a raised area of choroidal degeneration. Mr. Doyne: A case of ill-developed cornea. Mr. Pooley: Thrombosis of a retinal vein.(?) Mr. G. E. Henderson: Sections showing subconjunctival dislocation of the lens. Mr. Jessop: A case of sarcoma of the limbus. Mr. Doyne: Sclerosis of the retinal artery.

JOHN TWEEDY, P.R.C.S., President, in the Chair.

Thursday, December 10th, 1903.

This was a clinical evening and was given up to the exhibition of cases.

ARTERIO-VENOUS ANEURYSM OF THE ORBIT.

MR. N. C. RIDLEY showed a case of arterio-venous aneurysm of the orbit, recurring six months after ligature of the common carotid.

The patient was first seen in December, 1901, with paralysis of the left sixth nerve, following a fall on the head. In April, 1902, the left eye began to protrude, the pupil to dilate and the vision to fail. Iodide was given, but without any effect. In March, 1903, pulsation was first noticed with a thrill. On April 8th, 1903, the left common carotid was ligatured in the usual situation above the omo-hyoid. The result was the immediate cessation of the pulsation and symptoms. On July 28th faint pulsation was again felt, but there was no proptosis nor other symptoms, and the vision was $\frac{6}{36}$. When shown the pulsation and thrill were both very marked, although the patient still felt much relief from the operation.

The condition was probably due to a traumatic communication between the cavernous sinus and carotid artery.

MR. PRITCHARD showed a case of the same nature with corresponding result, and experience in connection with such cases were narrated by Mr. Johnson Taylor, Mr. Adams Frost, Mr. Hartridge, Mr. Fleming, Mr. Collins and Mr. Nettleship.

MR. BREWERTON thought that owing to the free communication between the branches of the two external carotid arteries it would be much better to ligature the internal carotid artery.

MR. FISHER, in view of the size of the communicating arteries in the circle of Willis, thought it unlikely that ligature of the internal carotid would be better than ligature of the common carotid, to say nothing of the much greater difficulties of the operation.

MR. RIDLEY, in reply, did not think that ligature of the internal carotid would be any more likely to cure the condition than that of the common carotid. If he did anything more he should feel inclined to clear out the orbit, but

in this case, as apparently in most of the others mentioned, the patient had derived much relief, although the condition could not be said to be cured.

“SILVER WIRE” ARTERIES.

MR. PERCY FLEMMING showed the drawing of a fundus with marked arterial degeneration.

The patient was a woman, aged 48, with granular kidney. She died of apoplexy a few weeks after the drawing was made. During life the arteries had a typical sclerosed appearance with “silver wire” lines along them. There was venous obstruction at the points where they crossed the veins. There were also hæmorrhages in the retina.

Microscopic sections were shown of the retina with photomicrographs: there was enormous thickening of the vessels.

MR. MARCUS GUNN showed specimens of “silver wire” arteries from a similar case.

MR. DOYNE showed a woman, aged 54, with somewhat similar ophthalmoscopic appearances. Her urine was healthy, but the radial arteries were thickened.

A discussion followed on the cause of the apparent constriction of the veins by the arteries.

RETINAL EFFUSION.

MR. DOYNE showed a case of retinal effusion in a patient aged 65 whose sight had recently failed. There was no history of syphilis, but years ago he had had gonorrhœa.

In the right fundus were discrete patches of fluffy whitish exudation, especially near the disc; some vessels were concealed by it. There was no obvious disease of the blood vessels. The disc was clear, and there were some pigment spots on the anterior capsule. Pigment spots were also seen on the capsule of the left lense. The effusion had extended since it was first seen.

PEMPHIGUS OF THE CONJUNCTIVA.

MR. WILLIAM ANDERSON showed a case of conjunctival pemphigus.

The patient was a woman, aged 29, who had always enjoyed good health until a sudden febrile attack four months ago. There was a general rash, becoming vesicular; the

eyes were dim, and the lids were closed for about four days, when adhesions were seen to have formed between the lids and the eyeballs; there was also a severe superficial ulcerative stomatitis. After a time there was complete desquamation, with shedding of the nails of the hands and feet. The skin of the arms, chest, back and legs when shown were covered with patches of dark-brown pigmentation. The lids of the right eye were thickened, and the lower *cul-de-sac* nearly obliterated. The upper one was free in its middle third. There was also a muco-purulent discharge but the cornea was clear. In the region of the lacrymal gland was a large retention cyst; vision = $\frac{6}{18}$. The left eye was in a somewhat similar condition, with vesicles in the lower fornix; vision = $\frac{6}{24}$.

HEREDITARY NODULAR OPACITIES OF THE CORNEA.

MR. HOLMES SPICER showed a case of this condition and some drawings. It was, he said, a family disease, though probably not congenital. Fuchs in one case had removed a portion of the cornea and found it softened and Bowman's membrane absent. The deposit, which was amorphous, lay in the substantia propria. One observer had described the deposit as sodium urate, but Mr. Spicer doubted whether it were so. The condition was progressive, and in Mr. Spicer's example the father as well as the daughter was affected.

MR. JOHNSON TAYLOR described a somewhat similar condition that he had seen in puppies; it was thought to be due to malnutrition.

MR. SPICER said that Fuchs had also seen this condition in dogs.

UNILATERAL ANOPHTHALMOS.

MR. A. H. P. DAWNEY showed an infant suffering from this condition. The child was very feeble and delicate, and without an anæsthetic it was impossible to say if a rudimentary eye existed.

MR. TWEEDY commented on the term used in describing this case. He thought the condition should be termed anophthalmia, and the child described as anophthalmos.

ABSTRACTS FROM MEDICAL LITERATURE.

By W. A. SHOEMAKER, M.D.
ST. LOUIS, MO.

A CASE OF PANOPHTHALMITIS IN TYPHOID FEVER.

W. Whitehead Gilfillan (*Medical News*, July 25, 1903) reports a case of panophthalmitis complicating typhoid fever, in which the eye symptoms set in on the twenty-sixth day of the fever. This is an extremely rare complication; less than a dozen cases have been reported.

AN INTERESTING CASE OF PIGMENTARY DEGENERATION OF THE RETINA (RETINITIS PIGMENTOSA.)

Walter L. Pyle (*American Med.*, Aug. 8, 1903) reports the case of a man 54 years old, who, with the exception of his ocular trouble, was in perfect health. The following points are of interest:

1. The accurate and comprehensive family history which could be traced for over a century.
2. The absence of any history of consanguinity.
3. The absence of serious ocular disease in any other member of the family.
4. The long retention of serviceable central vision despite contraction of the visual fields to within 5° of the fixation point.
5. The remarkable preservation of accurate color perception and sense of color-difference.
6. The noteworthy compensatory development of the sense of touch and hearing, estimation of distance, sense of location, etc.

THE PRESENT STATUS OF SUBCONJUNCTIVAL INJECTIONS IN OPHTHALMIC THERAPEUTICS.

Chas. Stedman Bull (*Medical Record*, July 18, 1903) from an examination of the papers published on this subject by the authors quoted, and from a study of all the cases of all kinds reported, thinks that the efficiency of the various solutions recommended for subconjunctival injection cannot be due to the increased local acceleration of the lymph currents, nor to

their antiseptic action, but to their local irritating properties. The author's opinion of this method of treatment is as follows:

"A careful observation of my own cases, in which various solutions were employed, has not been able to convince me that subconjunctival injections bring about any more rapid or favorable results than the other methods of treatment which we have hitherto employed for affections of the cornea, uveal tract or retina. In several cases of orbital cellulitis of an infectious character, however, I found that subconjunctival injections of a sublimate solution (1-1,000) did exert a very favorable and unusually rapid effect in hastening the supplicative stage, in reducing the dense infiltration of the orbital cellular tissue, and thus aiding in restoring the circulation to the strangulated parts.

"My own conclusions, based on observations of my own cases and a careful study of the literature of the subject, are that all reports of the beneficial effects of subconjunctival injections should be carefully criticised and compared with the results obtained by other methods of treatment before accepting them as of any real value."

THE INFLUENCE OF HEREDITY ON THE EYE.

John E. Weeks (*Medical Record*, Aug. 8, 1903) calls attention to the fact that:

"The transmission of peculiarities of form and function, of tendencies to degeneration and to disease, from parent to child for some generations affects the eye as well as other parts of the human body. The form, the color, peculiarity of movement, as well as peculiarities of the deep tissues of the eye are largely influenced by heredity. Consanguinity in the parents accentuates the hereditary tendency. In the greater number of cases of hereditary malformation it is not so much that the defect is handed down from generation to generation through a long line, as that the children of one union, because of some peculiarity of mother or father, all or part suffer."

The author discusses the following conditions:

Epicanthus, ptosis, coloboma of the iris, aniridia, polycoria (probably hereditary), coloboma of the choroid, inherited peculiarities of the cornea, albinism, microphthalmus, cataract (congenital and premature senile), optic nerve

atrophy, hemeralopia, retinitis pigmentosa, retinitis punctata albescens, glaucoma and hydrophthalmus.

The following list of diseases, due to hereditary syphilis, is referred to:

Alopecia affecting lids and brows.

Choroiditis, presenting mixed forms, occurring either as a congenital condition or before the twenty-fifth year, affects both eyes usually, however it may be confined to one eye.

Erythema of the lids, early in child life.

Iritis, acute, occurring in the first months of infancy.

Iritis, gummatous, occurring in the early years of childhood.

Eruptions, nodular, vesicular, papulo-squamous, all affecting the eyelids and occurring in childhood.

Optic-nerve atrophy, occurring congenitally or in the early years of life.

Ophthalmoplegia externa, rarely.

Palsies of eye muscles, nuclear.

Palsies of eye muscles, peripheral, occurring in childhood.

Parenchymatous keratitis, seldom before the age of six years and only very rarely after the age of thirty-five. Hutchinson narrates one case occurring at the age of sixty.

Periostitis of the orbit, in early childhood, pursuing an acute course.

Retina, pigment degeneration of (pseudo-retinitis pigmentosa).

Retinitis, hæmorrhagic.

Rupia, affecting the lids.

Tarsitis, occurring in early childhood, usually bilateral.

The transmission of faults in the shape of the eye, whereby the various errors of refraction, hypermetropia, myopia and astigmatism recur in the offspring, is not unusual.

Muscular anomalies, particularly the various phorias, are not infrequently transmitted.

Color-blindness of all degrees is also strongly influenced by heredity.

THE SURGICAL TREATMENT OF HIGH MYOPIA.

H. V. Würdeman and Nelson M. Black (*Journal of the American Medical Association*, Nov. 28, 1903) report the refraction of 8776 eyes, in 7160 of which a cyclopegic was

used; 16.9 per cent. of the latter number were myopic (including myopia, myopic astigmatism and compound myopic astigmatism). Of the total number 78 cases had more than 10 D.— In most of these cases the high degrees of myopia were complicated by a considerable degree of astigmatism, and the authors feel that had our foreign confreres carefully corrected the astigmatism in their cases, they would not have found it necessary to operate so frequently; as out of the 78 eyes all but eight were given comfortable and useful vision by the careful correction of their refraction. An operation was suggested in the eight eyes and accepted in six with good results, which were:

1. Increase in the visual acuity.
2. Enlargement of the retinal images.
3. Enlargement of the visual field.
4. Increased range for near work.
5. The wearing of light lenses instead of heavy strong spheric lenses, in a combination which permits of clearer and less distorted retinal images.
6. The pupil being brought nearer the retina the eccentric visual rays are more excluded.
7. And most important, the more extended use of the eyes obtained by the patients; in all cases a new world having been opened to their view. Detachment of the retina has not occurred in any of these cases, and even if it should happen, the German statistics show that it is only in 5 per cent., and this is the percentage of cases of high myopia in which detachment occurs without operation.

RÉSUMÉ.

1. Surgical treatment of myopia should be limited to those cases over —12.00 D. who suffer great inconvenience from their correcting lenses. The ideal cases for operation are those of —17.00 to —18.00 D.
2. The operation is mainly indicated in young adults.
3. Cases having active disease and changes in the ocular structure, such as progressive myopia, choroiditis, fluidity of the vitreous or detachment of the retina are not applicable.
4. The dangers of operative interference are more than counterbalanced by the results to be achieved, which are mainly, increase of visual acuity and of the visual field, and

more extended use of the eyes [which accompany diminishment of the refraction.

SYPHILIS OF THE EYE.

Wendell Reber (at a meeting of the North Branch Philadelphia County Medical Society, October 8, 1903) in taking part in a general discussion of acquired and hereditary syphilis called attention to the fact that when this disease attacks the eyes primarily the lesion is usually on the extreme margin of the lids. In the secondary stage the iris is most frequently involved. Statistics show that 50 per cent. of all cases of iritis are caused by syphilis, and the author believes we are justified in suspecting every case of iritis unless trauma, tuberculosis, microbic infection or rheumatism can be shown to be the cause. Choroiditis is as frequently of specific origin as iritis. The most frequent tertiary eye symptoms are the intra- and extra ocular palsies. These symptoms, if trauma and diabetes can be excluded, are usually of specific origin and are frequently followed by locomotor ataxia or general paresis.

THE CAUSES, PREVENTION AND MANAGEMENT OF MYOPIA.

J. Herbert Claiborne (at the fifty-fourth annual session of the American Medical Association) read a paper on this subject, and sums up his views as follows:

1. Myopia is a condition in which there is an increase in the antero-posterior diameter of the eyeball. This condition is, except in very rare cases, acquired. It is a distinctly vicious process, and in the great majority of cases tends to increase. It should, therefore, be regarded as a disease. It usually begins in childhood.

2. Its causes may be divided into predisposing causes and a direct cause.

3. (a) The predisposing causes are, in general terms: Heredity, naturally lax conditions of the eye tunics in certain individuals, the injudicious use of the eyes after sickness (usually in children after the exanthemata) bad illumination, improperly placed illumination, incorrect position in the act of reading, the existence of refractive errors, (generally astigmatism), which are uncorrected or improperly corrected, corneal opacities, any systemic condition which

tends to produce cerebral congestion, for example, constipation. (*b*) The direct cause is an elongation of the eye on its antero-posterior axis, at the posterior pole, except in the case of corneal astigmatism.

4. When myopia has once been acquired, its increase is directly caused by pressure on the globe by the extrinsic muscles, due to the convergence of the visual lines toward the far point—the convergence theory.

5. The weight of evidence and reason is distinctly against the accommodative theory.

6. Theoretically, full correction of the myopia is indicated, whereby the far point is thrust to infinity.

7. Practically this is not always possible.

8. The far point should be thrust as far as possible toward infinity, but, at the same time, it should be compatible with the best vision and the greatest comfort.

LESIONS OF THE EYE WHICH OCCUR IN THE COURSE OF DISEASES OF THE HEART, BLOODVESSELS AND KIDNEYS.

Chas. Stedman Bull (in a paper read before the New York Academy of Medicine, Nov. 5, 1903, *Med. Record*, Dec. 5, 1903) discusses his subject under two headings, viz.: (1) Ocular Lesions Occurring During the Course of Diseases of the Heart and Bloodvessels, and, (2) Ocular Lesions Occurring During the Course of Diseases of the Kidneys. Under the first heading he refers to (*a*) conditions which affect the blood pressure, and, (*b*) organic disease of the heart and bloodvessels.

General anemia frequently causes a distinct diminution of the intravascular tension, causing a pale condition of the optic discs, and, if the anemia lasts long, retinal hemorrhages.

Severe hemorrhages usually affect the retinal circulation and cause partial or complete loss of sight, usually bilateral, which may or may not be partially restored. In these cases the optic discs may be pale and the vessels narrow, or the ophthalmoscopic signs may be negative.

Anaurosis, after a hemorrhage, rarely occurs, and when it does it is usually in persons in poor health and occurs several days after the loss of blood. The loss of sight is often due to a hemorrhage within the optic nerve, and if it is far

back, the ophthalmoscopic symptoms are, for a time, frequently negative.

Retinal hemorrhages, without signs of inflammation, usually indicate increased blood pressure such as occurs in hypertrophy and valvular lesions of the heart, or of diseased retinal vessels, or of morbid conditions of the blood.

Diseases of the heart and bloodvessels may give rise to *thrombosis* and *embolism*. *Rheumatic endocarditis* is one of the frequent causes of embolism; it acts mechanically and excites no inflammation. *Ulcerative endocarditis*, being a variety of pyemia, may cause hemorrhages, thrombosis and abscesses in different parts of the eye, especially the retina choroid and conjunctiva.

Atheroma, *arterio-sclerosis*, and *fatty degeneration* of the bloodvessels frequently cause hemorrhages into the retina, choroid and ocular conjunctiva, especially in people past middle life.

Arterio-sclerosis is regarded as the cause of hemorrhagic glaucoma.

Endarteritis is by some authorities regarded as a cause of cataract.

Arterio-sclerosis of the *internal carotid* and *ophthalmic artery* often cause atrophy of the optic nerve.

“In *aneurysm* of the *aorta* or *innominate* artery, vasomotor and oculo-pupillary symptoms are often found on the corresponding side. Later, these initial irritative symptoms give place to ptosis, myosis and enophthalmos. Such aneurysms may also give rise to retinal pulsation. If the aneurysm involves the internal carotid artery, it may cause unilateral optic neuritis, and if such an aneurysm grows toward the orbit, there may be developed the symptoms of pulsating exophthalmos. Such an aneurysm has also been known to cause total paralysis of all the muscles of one eye, and, also anesthesia of the lids, eyebrows and conjunctiva, from paralysis by pressure on the ophthalmic division of the fifth nerve.”

Cerebral apoplexy and *embolism* frequently cause sudden paralysis of the ocular muscles.

The absence of pupillary symptoms indicates an embolism. The presence of spastic myosis, followed by mydriasis during a seizure, points to apoplexy.

“*Non-infectious marantic thrombosis of the cavernous sinus* causes paralysis of the motor oculi nerves, dilated and immovable pupil, anesthesia of the parts supplied by the trigeminus, pronounced venous stasis of the retinal veins with numerous hemorrhages and impairment of sight from pressure on the optic nerve. If, in addition, there is edema of the lids and protrusion of the eyeballs, the process is in the vicinity of the orbit.”

The most common *ocular lesions occurring in the course of diseases of the kidneys* are the two forms (degenerative and exudative) of retinitis and a neuro-retinitis albuminurica, the *direct* cause being a disease of the bloodvessels.

Other lesions are: edema of the eyelids, chemosis of and hemorrhages into and beneath the ocular conjunctiva, iritis, lesions of the ocular muscles (denied by some writers), choroidal hemorrhages, papillitis, and uremic amblyopia or amaurosis. The last-named disease being due to an acute auto-intoxication. The disturbance of vision is always bilateral, develops rapidly and passes into total blindness. Ophthalmoscopic signs are negative and the symptoms promptly disappear under appropriate treatment.

HEMERALOPIA FROM EPIDEMIC PAROTIDITIS.

Arturo Campani (*Gazzeta Degle Ospedali e Delle Cliniche*, Aug. 30, 1903) refers to the fact that hemeralopia is not spoken of as a complication of mumps by the text books, and reports a case. It lasted five days and then gradually disappeared with the disappearance of the parotiditis, no fundus changes were found. The author holds the toxins of the disease responsible for the symptoms.

DIAGNOSIS OF TUMORS OF THE ORBIT.

F. Ferrier and V. Morax (*Révue de Chirurgie*, vol. xli., page 1235,) report two cases and discuss the operative indications. They also give a review of sixteen other cases, all of which were fibromata, or sarcomata or a combination of both with one exception; this proved to be an endothelioma.

THE TREATMENT OF CONVERGENT STRABISMUS.

W. Y. Craig (*N. Y. Med. Journal*, Oct. 17, 1903) offers the following conclusions:

1. The earlier the child is seen, the better the prospect for a cure.

2. The vision of squinting eyes can in a majority of cases be improved and some function restored, if treatment is begun early.

3. A small percentage of cases of convergent squint can be cured by mydriatics, glasses and proper exercises, without operation.

4. The correction by non-operative methods is much to be preferred, as the motility of the eye is more perfect and the deformity produced by sinking of the caruncle is avoided.

5. Operative procedures should be employed in those cases in which non-operative treatment after a thorough trial has failed, and in those cases in adults in which we operate for the cosmetic effect.

SOME OBSCURE CASES OF EYE STRAIN.

F. W. Marlow (*N. Y. Med. Journal*, Sept. 26, 1903) reports three cases, from the study of which he draws the following conclusions:

“The most careful investigation and the apparently accurate correction of all the discoverable errors may completely fail to relieve the symptoms; may, in fact, aggravate them, and yet the symptoms may still be due to eye strain. Indeed, the fact that glasses which are apparently correct aggravate the symptoms is, I believe, in most cases evidence that the latter do arise from eye strain, and that a latent error is present; usually an error in the muscle balance. In all the cases described the possibility of the existence of the kind of error which was finally found to be present was fully appreciated from the first. In the second place, I believe that lapse of time is a very important factor in the elucidation of the true nature of these cases. The action of the accommodation in neutralizing refractive errors is so automatic and persistent that all efforts to annul it sometimes fail to be completely effective; even atropine and other powerful cycloplegics failing to bring about a complete relaxation. The natural relaxation due to advancing years often reveals a hitherto latent error. Similarly the instinctive tendency to see single and not double causes the intrinsic muscles to contract so as to maintain a parallelism of the visual lines. This contraction is so constantly maintained that the muscles get into a condition of tonic spasm which is extremely persistent. Just as we have a

spasm of the accommodation in cases of hyperopia and astigmatism in the interest of clear vision, so we have a spasm of the extrinsic muscles in the interest of single vision, and the latter is far more difficult to demonstrate than the former. It is surprising what high degrees of error may remain latent year after year and produce a train of symptoms absolutely intractable to treatment until the manifestation and correction of these errors has occurred. I have seen some cases which have inclined me to think that not only is lapse of time the only thing which will reveal the true nature of the ocular conditions, but that old age itself is reached, in some cases, before the true condition becomes manifest."

BOOK REVIEWS.

THE REFRACTION AND MOTILITY OF THE EYE FOR STUDENTS AND PRACTITIONERS. By WM. NORWOOD SUTER, M. D. Philadelphia: Lea Bros. & Co. 1903, pp. VII and 390. Price \$2.50.

To those familiar with Dr. Suter's admirable little book on optics and his chapter on refraction in Posey's and Wright's Treatise on Diseases of the Eye, Ear, Nose and Throat, it is not a matter of surprise that this more systematic treatise on refraction should make its appearance. The evidences of his thorough grasp of the fundamentals of his subject indicated in those efforts are again manifested here. He has managed to condense a large amount of accurate and well digested information in his 390 pages without leaving untouched any necessary or important matter pertaining to either refraction anomalies or defective motilities. And it is just here that the great value of Dr. Suter's book lies. He is accurate, as his thorough familiarity with the underlying optical principles allows him to be, and this complete mastery of his subject enables him to present his matter in that abbreviated form, which seems to be demanded in a hand book.

It might occur to the reader of experience, with this or any other book of like nature that some particular portion might have been enlarged or another more restricted in its consideration, but that is a matter of individual opinion and

does not affect the value of the work as a whole and as fulfilling the ends of its being.

Anything like an analysis of the work is, of course, impossible in a short notice like this. Suffice it to say that the first 310 pages are given to the subject of refraction alone, the remaining 80 being concerned with disorders of motility. We observe with satisfaction that he adopts the prism-dioptre system of notation, and are pleased to note an absence of certain incorrect terms and phrases which disfigure some other of our treatises on similar subjects. Thus he does not state that he has "refracted" anybody and he uses "skiascopy" and not "retinoscopy"—a mongrel word, even if it designated the thing it is used to describe, which it does not. It is true we have many words in long usage which are hybrids of Greek and Latin, but when a new one is introduced there can be no excuse for such unlawful combinations. If such a word were even needed to describe our inspection of the retina, it should be *Dictyoscopie*—*δῖκ-σῶρ*, being, according to Hirschberg, our authority on ophthalmologic Greek, the synonym of the Latin *retina*. Dr. Suter has gone into the literature of his subject very thoroughly and is thus enabled to give credit where it is due. This is especially true as to American workers, though never to the ignoring of the contributions from foreign authors. It is certain that the student never will be misled if he follows the teachings of this little book.

S. M. BURNETT.

DIE AUGENÄRZTLICHEN OPERATIONEN (the operations on the eye). By PROF. D. W. CZERMAK. Part 13 and 14. Wien, 1904. Carl Gerold's Sohn. Price 7 marks.

After an interval of several years we are glad to welcome these new parts of this excellent text-book. The present numbers deal especially with the operations on the crystalline lens and the subjects are treated in the same exhaustive and superior manner as those in their predecessors.

UEBER DAS SYPHILOM DES CILIARKÖRPERS (on the syphiloma of the ciliary body). By PROF. DR. TH. V. EWETSKY. Berlin, 1904. S. Karger.

In this monograph the author has collected all previously reported cases of syphiloma of the ciliary body, and adds to

them four new ones. On the hand of this material, and after having rejected all doubtful cases, he draws certain conclusions which the interested reader must look up in the original. The monograph is excellent and should be widely read.

DIE FUNCTIONSPRUEFUNG DES AUGES UND IHRE VERWERTHUNG FUEER DIE ALLGEMEINE DIAGNOSTIK (Functional examination of the eye and its value in general diagnostics). By PROF. DR. O. SCHWARZ. Berlin, 1904. S. Karger.

The charm of this book lies in the rather original manner in which its subject is handled. It includes chapters not found in such a complete form in other text-books on the functional examination of the eye, like the pupillary phenomena and the usefulness of the disturbance of function for the recognition of disease of the eye, as well, as of other parts of the body. Its language is clear and simple and to the point so that students can grasp the subject though little familiar with its mathematical side. The book deserves a wide circulation.

NON-SURGICAL TREATISE OF THE PROSTATE GLAND AND ADNEXA. By G. W. OVERALL, A.B., M.D. Chicago: Rowe Publishing Co.

The author states that in 25 years of practice he has been enabled, after many years of research, to devise ways and means by which to reach the seat of prostatic disease. He is opposed to the use of the knife in most cases and has been very successful in the application of electricity to the diseased parts. With practical illustrations and the relation of incident cases he supports his position. The book is very interesting and should stimulate others to try the author's methods.

PAMPHLETS RECEIVED.

"Vernal Conjunctivitis," by C. Posey, M.D.

"Eye Complications of Smallpox," by A. R. Baker, M.D.

"A Case of Tuberculosis of the Conjunctiva; Recovery Without Local Interference," by F. L. Henderson, M.D.

"The Desirability of a Uniform Notation of the Meridians of the Eyes and Those of the Visional Field," by H. Knapp.

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ORIGINAL ARTICLES.

A CASE OF PRIMARY UNPIGMENTED SARCOMA OF THE IRIS.

By ADOLF ALT, M.D.

CLINICAL REPORT.

By L. R. CULBERTSON, M.D.,

ZANESVILLE, O.

PRIMARY sarcoma of the iris is rare enough to warrant, or rather still demand, the publication of every case which comes under observation. In the last exhaustive treatise on this subject by C. A. Wood and B. Pusey (*Archives of Ophthalmology*, 1902, v. XXXI, 4 pp. 323 to 383) the authors state that they have records of 83 cases in which histological examinations were made. To these cases a few new ones have since been added.

The eye containing the tumor which is the subject of the following description, was kindly sent to me by Dr. L. R. Culbertson with the following remarks:

“Mr. D. G., a farmer, 72 years of age, consulted me on June 4, 1903, stating that the vision in his left eye had been failing for some time and that for about one year he had noticed a spot or growth in the iris of this eye. Some twenty years previously this eye had been struck by the limb of a tree, but he had never suffered any inconvenience from this, nor has

he had any pain in the eye at any time. There is no history of a malignant growth in the family.

“*Stat. praes.* Right eye $V=\frac{5}{5}$, with + 1 D. Left eye $V=\frac{5}{12}$, with + 1.75 D. In the left eye a small pinkish growth occupies the upper nasal quadrant of the iris. The pupil dilates regularly, but incompletely, upon the instillation of atropine. Ophthalmoscopic examination disclosed an immature cataract which prevented a minute inspection of the details of the fundus which, however, appeared normal.

“My diagnosis of sarcoma of the iris was concurred in by Dr. C. F. Clark, of Columbus, O., to whom I sent the patient in consultation.

“On June 17th I enucleated the eye. The healing was uneventful and there has been no return of the growth in the orbit (Feb. 1st, 1904.)”



FIG. 1.

When the eyeball reached me it was not in as good a state of preservation as I should have wished it to be, as it had not been put in any conserving fluid. The cornea was partly dried out and had sunken in the center. Its transparency was gone and it was impossible to see the contents of the anterior chamber in consequence. After cutting the eyeball in two, a tumor was seen to occupy the iris on one side altogether, while the diametrically opposite part of the iris seemed normal. Macroscopically no alterations could be found in the other tissues of the eyeball, except some signs

of cataract formation in the cortex of the lens which, however, was in its normal position. Where the thickness of the tumor was greatest it filled apparently the whole of the anterior chamber and touched the cornea.

Microscopical examination. In sections going through the central plane of the tumor, the latter is seen to start at a little distance in front of the root of the iris and to reach to the pupillary edge. (See Fig. 1.) The tumor elements occupy the anterior part of the iris and have left a small part



FIG. 2.

of the posterior portion intact. The retinal iris layers are unaffected. (See Fig. 2.) The anterior surface of the tumor is covered by numerous layers of cells which are tightly packed. These cells are perfectly round where they lie isolated, where they are packed together they appear polygonal. They are probably proliferated from the endothelial cells of the anterior iris surface.

The cells of which the tumor proper is composed are spindle and round cells. The spindle cells are of two kinds, some are small and short, others are of considerable length, with a long oval, sometimes rod-like, nucleus. The short

spindle cells are more frequent in what are probably the newer portions of the tumor, while the long ones are more frequent near the surface. (See Fig. 3.) The spindle cells with a rod-like nucleus appear so similar to non-striated muscle fibres, that for a time I thought of a possibility of my having to deal with a leiomyomatous sarcoma. Further study of the tumor, however, proved this idea to be erroneous, since the sphincter fibres, even where the tumor encroaches upon them, can be easily distinguished as such by their shape and reaction to the staining agents. Among these bi-polar spindle

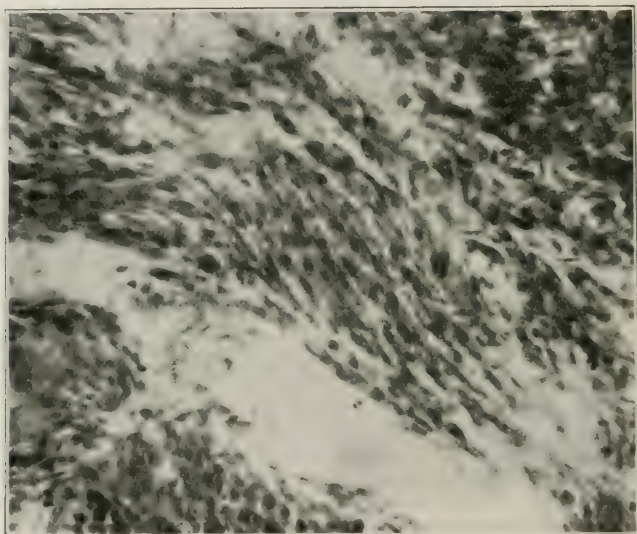


FIG. 3.

cells, which are arranged in bundles and whirls, as is usual in spindle cell sarcomata, lie here and there more slender bi-polar spindle cells, and some with three and four projections, which contain granules of pigment and which are remnants of the iris stroma cells. No intercellular substance can be found. In the portions which were in touch with and probably pressed against the cornea numerous necrotic patches are seen. Such degenerative changes were not found in Woods' and Pusey's cases. (See Fig. 4.)

While the spindle cells form the largest part of the tumor, a comparatively large portion of it consists of round cells.

These, too, are closely packed and no intercellular substance can be made out between them. In studying the tumor, I have gained the impression that, perhaps, the round cells are the original tumor cells and that these gradually have assumed the spindle shape.

The tumor contains, furthermore, microscopical patches of pigment granules, relics of the destroyed stroma cells. Larger accumulations of pigment granules and polygonal pigment cells are found in the iris outside the tumor. The tumor cells proper are free from pigment throughout.

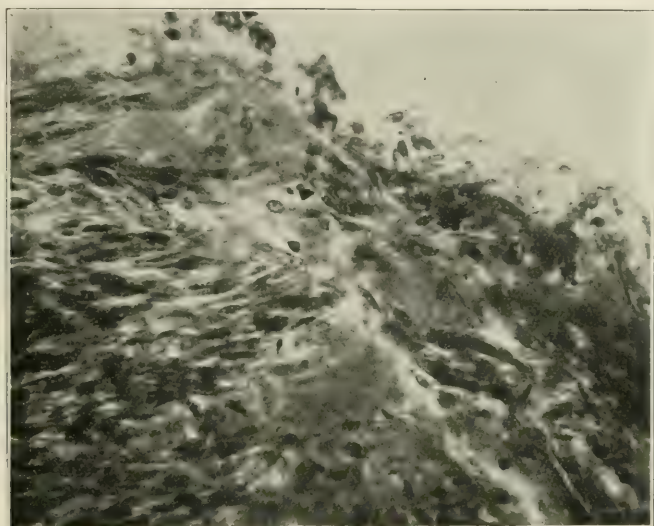


FIG. 4.

Bloodvessels are rather numerous in the periphery of the tumor and contain blood and show no material change in their walls. In the more centrally located parts of the tumor numerous empty capillaries are seen which appear normal. The larger bloodvessels, however, are changed into hyaline bands in which a few nuclei, but no lumen can be found. (See Fig. 5).

Around some of the bloodvessels a small round-cell infiltration reminds one of an inflammatory process. These cells are readily distinguished from the much larger round cells of the tumor. Certain it is, that the bloodvessels have

nothing to do with the origin of this tumor. There is nowhere anything resembling a peri-endothelioma in this case.

While macroscopically this tumor appeared to be as yet confined to its original site in the upper inner quadrant of the iris, microscopical examination shows, that it has spread along the ligamentum pectinatum all around the iris periphery. In all of the meridional sections in the iris angle diametrically opposite to the tumor the root of the iris is attached to the inner surface of the cornea, as we see it in glaucoma. This part of the iris, as well as the anterior part of the ciliary body,

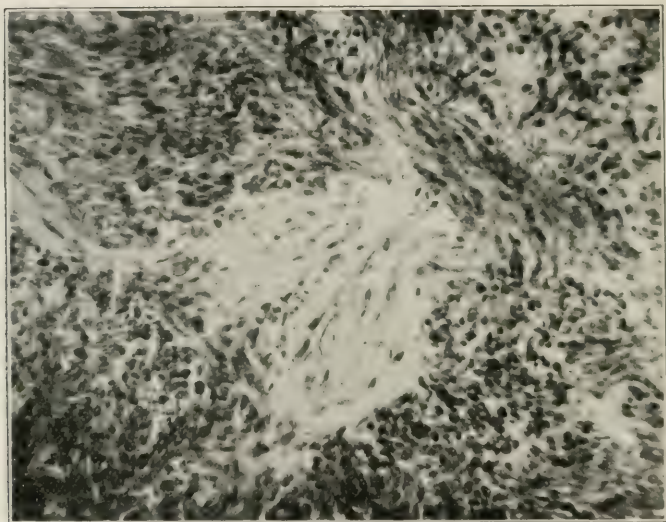


FIG. 5.

is densely infiltrated with the round tumor cells, which are also spreading forward on Descemet's membrane. (See Fig. 6.) One section just happened to pass through a part in which these tumor cells have broken through Descemet's membrane and crept into the sclerocorneal tissue in front of it. (See Fig. 7.) It is somewhat strange that the spreading of the tumor towards the outside of the eye should rather have taken place in this region, than where the original tumor lies. This shows, how little safety is to be placed in removing an apparently localized sarcoma of the iris by iridectomy, as this microscopical perforation could no more have been observed

clinically than the ring-like spreading of the tumor cells along the ligamentum pectinatum.

Aside from this manner of growing of the tumor *per continuitatem*, there are several small isolated metastatic tumors in the iris at some distance from the original tumor. They form small roundish nodules and appear to grow from the surface of the iris into its depth. (See Fig. 8.) The elements which compose them are round cells in every instance, which, again, seems to prove that the round cells are the younger forms, while the spindle cells are the older forms of the cell elements of which this tumor is composed.



FIG. 6.

A peculiar fact is that the iris tissue outside of the tumor shows no cell infiltration and no signs of inflammatory reaction. Yet in every section, the ciliary body is infiltrated with small round cells, not, however, tumor cells.

Aside from the beginning cataract, the remaining structures of the eye show nothing noteworthy.

I do not think any doubt can arise as to the nature of this tumor. It is plainly a sarcoma and an unpigmented one. The small quantity of pigment found in it, has nothing to do with the tumor cells which are throughout free from pigment. In this particular this tumor differs from others in which pigmentation of the spindle cells seemed to point to

the origin of the new formation from the stroma cells of the iris.

While it has been frequently observed that a sarcoma of the iris started from a pigment spot or naevus which had been seen in the iris for years before the development of the tumor, there is no such history in our case, although, it must be confessed that this history is rather incomplete. Yet, it is not to be expected that the patient, a man 72 years of age, should have overlooked the existence of such a naevus. On the other hand, I do not think that the trauma which this eye had

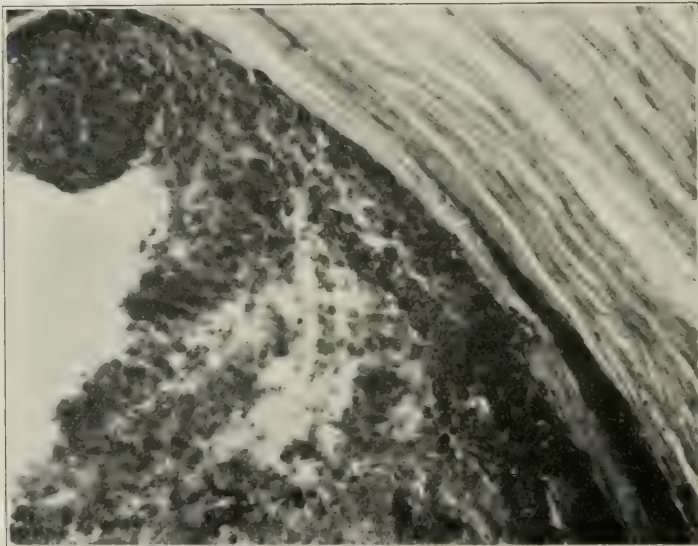


FIG. 7.

undergone about 20 years previous to the development of the tumor can well be held responsible for it. This point, therefore, is not cleared up.

In Wood's and Pusey's monograph two cases of sarcoma of the iris, previously reported by me in this Journal (1887 and 1890), are mentioned as primary sarcomata of the iris, while the second of these cases undoubtedly had originated in the ciliary body and grown into the iris.

In the supplement number of the *Klinische Monatsblätter* 1903, B. Kayser publishes an account of "a primary sarcoma of the iris which started from a *naevus vasculosus iridis*."

His description and illustrations tally almost exactly with one of the two cases of vascular nævus of the iris which I have described as a capillary angioma of the iris (this *Journal* Dec., 1900). In referring to these two cases Kayser implies that they, too, should be considered as sarcomata having sprung from a vascular nævus, and he stated that the long period of years needed by these tumors to reach the development which led to the enucleation of the eyes and the lack of all inflammatory reaction are not necessarily proof of their benignity. Yet, in his case, while there were no inflammatory symptoms, the tumor had not only infiltrated the neighboring tissue, but, also, led to the formation of metastatic nodules in the iris,



FIG. 8.

just as in the case which is the subject of the present paper.

Kayser states, furthermore, that it is Ziegler's opinion that the peculiar canals and cavities in these tumors are probably due to the fact that tumor cells grew into the lumina of the numerous bloodvessels and so divided them into numerous small cavities of which it remains doubtful whether or not they were filled with blood during life. Perhaps, they were filled with aqueous humor.

As there was no tumor infiltration into the neighboring iris and no metastatic nodule formation in my cases, I am still inclined to adhere to the opinion that the two cases, I described as vascular nævi, were really such and not sarcomata of the iris.

SUBCONJUNCTIVAL INJECTIONS OF ALKOHOL.*

BY PROF. D. M. PESCHEL.

FRANKFORT-ON-M.

Translated by Adolf Alt., M. D.

SINCE 1896 I have systematically employed subconjunctival injections of alkohol in suitable cases of acute and chronic inflammatory affections of the eyes, yet, I bring this matter before the ophthalmic public only now after having treated a sufficiently large number of cases to have gained a well-founded judgment as to the value of this method.

The favorable results which had been reached by Ochsner (1895) v. Langsdorff, Salzwedel, and others, by employing alkohol packs in erysipelas, phlegmon, lymphangitis, furuncle and panaritium, encouraged me to make use of the anti-phlogistic action of alkohol on the eye, also. For this organ it could not well be done by packs, but easily by means of subconjunctival injections. These have the special advantage that the whole of the injected quantity can act, while with the packs a great deal is lost by evaporation, and the skin does not absorb alkohol easily. A smaller quantity, therefore, when injected must have a much greater effect than a much larger quantity applied externally.

According to numerous recent experiments this effect is above all that of a powerful disinfectant (Epstein, Minervi, Salzwedel, Elsner, etc.) Especially in the moist tissues which are permeated by the injected alkohol, this disinfecting quality of the alkohol is most powerful, while absolute alkohol does not act on dry infectious material, or at least but slightly. The disinfection of the hands with alkohol (Fürbringer) is in general use. Another illustration of the disinfecting quality of alkohol is the well-known fact that (the schyzomycetes in favus, trichophytia and piedra) can be killed by alcoholic vapors, and pure cultures of the specific germs obtained which are not affected by alkohol. The disinfecting quality of alkohol is undoubtedly the reason in part why Unna's alkohol sticks act so well in parasitic skin affections.

Furthermore, alkohol stimulates the tissues (Buckner, Fuchs and Megele) and produces an enlargement of the local

*Klinische Monatsblätter für Augenheilkunde, November—December, 1903.

arteries and increase in arterial pressure, with which are combined a better permeation of blood of the organs, increase in the lymph stream, absorption of pathological exudations and elimination of noxious substances. Moreover, more leukocytes with their products—the bactericidal alexines—are brought to the foci of infection. Although it is known that the alcohols when given internally do not produce a leukocytosis of the blood, this does not stand in the way of their causing an emigration of leukocytes into the tissue when locally applied.

Finally, alkohol has a specific influence on the lymph circulation because it accelerates the endosmotic current of salt in the tissues. When alkohol is added to salt solutions the maximum of acceleration of diffusion is reached if the solution contains 4 per cent. of alkohol, while an addition of 10 per cent. and more, markedly retards diffusion. Alkohol is found in the tissues to be exactly of a percentage which favors diffusion. Gréhan found in dogs, killed by acute alkohol poisoning 0,57 per cent. of alkohol in the blood, between 0,325 and 0,41 per cent. in the tissues.

Subconjunctival injections show the effect of alkohol on the local circulation of blood and lymph in an eminent manner. Alkohol produces a far-reaching flooding of the tissues with lymph, a pretty obstinate but harmless and painless œdema of the conjunctiva bulbi and eyelids, which radiates from the point of injection. This acute lymph-flood may be compared with the one caused by dionin, but is less evanescent and does not get weaker in subsequent injections as with dionin. After the first injection of 15 per cent. alkohol (see later on about dosage) this œdema is generally mild and often permits of a further injection after two days. This then is followed by a more obstinate œdema, so that it is usually best to wait with further injections for 4 or 5 days until the œdema is sufficiently reduced. This œdema is extrabulbar. Neither with the ophthalmoscope nor by direct examination of a rabbit's eye which had been so treated and enucleated, could I find a trace of œdema in the interior of the eye. Nor could I see an œdema of the optic nerve when the dosage of the alkohol was correct. Yet, the powerful influence of this peribulbar lymph flood on the absorption of disease foci within the eye

and optic nerve is not a theoretical assumption, but is at once evident in the cases so treated. I must, however, warn against overdoing with this treatment, especially against a too rapid succession of injections because this might cause an œdema in the depth of the orbit which might even spread into the cranial cavity.

I have been able to prove that the alkohol injected subconjunctivally enters the interior of the eye, in the eye of a 2-year old kitten, into which I had made an injection of 1 gramme of 70 per cent. alkohol. I killed this animal 3 hours after the injection, made exenteration of the globe, and tried to find alkohol qualitatively. The contents of the eye were quickly rubbed with water in a dish, and then distilled. Only the first distillate was collected and again distilled with some potassium carbonicum. The distillate from one eye was treated after Lieben's method with caustic potash and iodine, slightly warmed and allowed to stand over night. A small quantity of iodoform crystals resulted. Under the microscope they showed as hexagonal plates and stars with 6 radii. The distillate of the second eye, left exposed to the air with a mixture of platinum and asbestos, assumed an acid reaction, and by the addition of a trace of silver oxyde acetate of silver was formed.

Since 1891 I have used in a very extensive practice in numerous cases of keratitis, ulcus, corneæ, iritis, iridochoroiditis, etc., injections of sublimate, oxycyanide of mercury and sodium chloride, and have had good and bad results. In one case of ulcus with a small hypopyon I saw the next day after a subconjunctival injection of sublimate (1 gramm of a 1:5000 solution) the hypopyon markedly increased. Since then I have been rather skeptical concerning the injections of sublimate in acute inflammatory processes. I have never seen such noxious effects from any injections of alkohol.

Rothmund who in 1866 as the first recommended subconjunctival injections of Na Cl, limiting the indication to the stimulation in refractive exudation into the cornea in parenchymatous keratitis, says in parentheses, that alkohol or chloroform, might be used in a similar way. But the promised larger paper, announced in this preliminary notice, has never appeared and it seems, therefore, that he had neither had

very good success with the Na Cl injections which he advised to repeat after two weeks only, nor had he ever used alkohol. There is no mention made in the subsequent ophthalmic literature of subconjunctival injections of alkohol. Therefore, nobody has determined their indications.

The following experiences were made concerning the dosage: Strong parenchymatous injections of alkohol produce quickly and certainly sclerosis of the connective tissue, scar-formation, which peculiarity is made use of in surgery in order to cure hernia (Schwalbe's method), struma, lipoma and varices. That, when long continued and often repeated, even the smallest quantities of alkohol have a similar effect is clear from the fact that chronic alkohol poisoning causes a connective tissue degeneration of different organs. Experiments made on guinea pigs have shown me that a subconjunctival injection of $\frac{1}{2}$ gramm of 50 per cent. alkohol, and more so when 70 per cent. alkohol was used, was followed by œdema, hæmorrhages and emigration of leukocytes in the conjunctiva bulbi and subconjunctivally. After the injection of 70 per cent. alkohol a low-grade leukocytosis could be seen in the spaces of Fontana, the ciliary body, the choroid and the sheaths of the optic nerve when the eyes were fixed 24 hours after the injection. This was easily discernible when the sections were compared with sections from the healthy fellow-eye.

Guided by these experiences, and not forgetting the fact that even 30 per cent. alkohol by its coagulative power will fix the cells and nuclei of the tissues, I have thought that 15 per cent. alkohol would be the best correct concentration for therapeutic purposes and have mostly used this in the quantity of 1 ccm. for subconjunctival injection. I have found that in sensitive individuals, especially women, this concentration produced a very severe and persistent œdema, also, nausea, and in these cases I had to use 10 per cent. alkohol. The 15 per cent. alkohol caused in such patients in rare cases photopsiæ. On the other hand 10 per cent. alkohol in most cases hardly produces a peribulbar œdema and is therefore not sufficiently energetic in its action to be of therapeutic value. A complication arose when I desired to add 1 mm. cocainum hydrochloricum and cooked the liquid, for sterilization, since the boiling point of 15 per cent. alkohol is not

high enough for this purpose and in the boiling of the liquid some alkohol would evaporate. I, therefore, first cooked a syringe full of a 1 per cent. cocaine solution (1 mmg. of cocaine) and used it at blood heat, and then made the mixture with sterilized absolute alkohol expressly for each injection. It was necessary to use a sterilized dropper of a known size of the drops, in order to get a constant quantity of alkohol. Lately I used one which gave 10 drops of alkohol for 0,24 ccm. and 24 drops of water for 1,33 c.cm. The mixture of the two equals about 15 1-3 alkohol. The piston of the syringe was made of glass or asbestos, never of oiled leather. Before the injection the conjunctiva was cocainized. The injection was repeated only after the usually mild reaction had passed off, rarely after 1, usually after 2 to 5 or more days. The number of injections varied according to the period of the disease and in some chronic cases (parenchymatous keratitis, disseminate choroiditis) reached 10. The place of injection was changed as much as possible. I never observed subconjunctival scarformation by this method, but I found this to occur in animal's eyes after the injection of 20 and more per cent. of alkohol. It is not very rare that a small subconjunctival hæmorrhage occurs after the injection, which is of course of no importance. The injections may be made under the conjunctiva bulbi or the retrotarsal folds. In the latter case the œdema of the skin of the lid is greater, in the former case that of the conjunctiva bulbi. When a deep injection is made in the retrotarsal fold the fluid may not spread at all into the ocular conjunctiva, but pass into the anterior orbital tissue. In affections of the anterior part of the eyeball and probably in general this is not the best method and it should always be the aim to have at least a part of the fluid go under the ocular conjunctiva.

I shall now give a short account of the diseases in which I have successfully employed the subconjunctival injection of alkohol. Almost in all of the cases simultaneously other modes of treatment were employed so that not all of the improvements and cures could be attributed to the alkohol injections. Yet, under certain circumstances it was possible to observe their effect, for instance, when, the other treatment being temporarily stopped, an injection of alkohol brought

about the diminution of the inflammatory symptoms or an improvement in function, etc.

Of *keratitis* 5 cases of the acute, circumscribed form partly with ulceration, were treated with 2 to 4 injections. In one case only no direct curative effect could be seen, the other cases healed rapidly. In two of these cases the alkohol injections prevented an ulceration and brought on an absorption of the infiltration. In all cases disinfecting eyewashes were used and sometimes atropine.

In a case of *lime-burn of the cornea* having been treated for 8 days with oxycyanide of mercury and airol insufflations a superficial ulcer of the cornea appeared with severe symptoms of irritation so that with atropine the pupil could be dilated with difficulty and for a short time only. After one alkohol injection the pupil dilated on the following day, and after a second injection 3 days later a rapid healing resulted.

A case of *paracentral staphylococcus ulcer* of the cornea with hypopyon healed, leaving a very small scar, with three injections, besides an oxycyanide of mercury wash. Five cases of trachomatous keratitis, two with ulcers, were brought to a quick and much more favorable termination, than is usual in trachoma, by 4 to 5 alkohol injections combined with other therapeutic measures. The lid affection and the pannus did not appear to be influenced thereby. Three cases of parenchymatous keratitis due to congenital lues were treated with a mild course of mercury and the usual topical applications, but were undoubtedly brought either to a quicker healing than usual, or with less of a scar and ulceration of the cornea with 6, 7 and 10 alkohol injections. In a fourth typical case of parenchymatous keratitis I did not employ the alkohol injections until the typical inflammatory symptoms were gone and the stage was reached in which a diffuse vascularized opacity with a denser center covered both corneae. This stage had been reached in about three months in the right and in three and a half in the left eye under the application of yellow oxide of mercury ointment. I then made 10 subconjunctival alkohol injections in the left eye only in the course of 50 days and not only saw the opacity clear up quicker than in the right eye, but, also, with a better final

result, so that while after two months vision for distance, was not much better than in the right eye (10/100 resp. 10/200), the left eye could read Snellen 0,8 easily with + 3 D., while the right eye barely read 1,1. This case convinced me that the injections accelerated the absorption of the exudations and prevented their permanent organization.

I will add here at once that in four cases of large recent *corneal opacities* which remained after keratitis circumscripta and corneal ulceration, by means of 6 to 8 alkohol injections added to the application of yellow ointment, I have produced a rapid and highly satisfactory clearing up. In one case (in a young man) of very obstinate vascular keratitis with infiltrations in which different of the usual local medicamentations besides constitutional treatment had been made use of, a decided improvement was reached only by 4 alkohol injections, and by 3 further injections in the course of 3 months the pannus serophulosus was greatly reduced. In similar cases in children I have never made injections, since they would necessitate a general narcosis.

In 3 cases of *ulcus serpens* with hypopyon, one of which was complicated with dakryocystoblennorrhœa, I found from 3 to 5 injections very effective. Of course, other modes of treatment were simultaneously applied in these cases, as antiseptics, moist heat, treatment of the disease of the lacrimal sac, etc., yet, I could see with certainty that, when a slow progress of the disease was going on, the injections stopped this. In one case, however, in which while the infected progressing edge of the ulcer had assumed a much better appearance, there yet remained a possibility of further progress, I touched this with the sovereign Paquelin, whereupon healing took place at once.

A case of true *corneal abscess* in an eye with an anterior synechia was brought to a favorable end by 6 alkohol injections. The little abscess was formed near the site of the synechia in the posterior layers of the otherwise clear cornea due to infectious germs which had remained behind after former iritic attacks, had in three weeks spread through the anterior lamellæ to the surface and healed after this perforation. The symptoms of irritation were quite severe and the alkohol injections reduced these and prevented further spread-

ing. Of course, other medicamentation, as atropine, moist heat, etc., was added.

Two cases of *rheumatic episcleritis*, one of which had lasted for more than 6 months, were very favorably influenced by the alkohol injections. In the recent case 4 injections, in the chronic one 8 injections, with other treatment, sufficed to perfect a cure.

Six cases of acute and subacute *iritis*, several of rheumatic, one of syphilitic, and one of gonorrhoeic origin, reacted on 4 to 7 alkohol injections by a reduction of the inflammatory symptoms and absorption of exudates. This was plainly visible, although other treatment was employed. In one case of very tedious *iritis serosa*, which in spite of very energetic treatment had already lasted 9 months, I produced in one month by 5 alkohol injections a great reduction in the symptoms and absorption of most of the deposits on Descemet's membrane, so that the effect of this therapeusis was very evident.

A *hyphaema* after trauma in a man 60 years old, which did not yield to pressure bandage and atropine, was promptly absorbed after 2 alkohol injections.

A case of subacute *tenonitis* with œdema of the conjunctiva and exophthalmus, in which a physician had diagnosed a rapidly growing orbital tumor, was rapidly improved, and cured in a few weeks by 3 alkohol injections and moist heat.

Traumatic *iridocyclitis* from a deep burn with melted lead of the sclerotic in the region of the root of the iris, another case due to contusion of the eyeball, further on a case of *iridocyclitic* irritation with ciliary neurosis following the extraction of a soft choroiditic cataract, were treated with alkohol, besides atropine and other local applications; 3 to 5 injections with intervals of 2 to 6 days had an undoubted beneficial influence on the course of the disease.

Cyclitis in an atrophic eye which ran a slow course with exacerbations, by means of 8 alkohol injections, was improved to such a degree that an artificial eye could be worn on the stump; 6 months later, however, when the irritation recurred, I preferred to enucleate the stump.

In a case of *perforating trauma* of the sclera just behind the ciliary body with profuse hæmorrhages into the vitreous

body, caused by a puncture with a pocket-knife, an infectious choroiditis resulted, which, beginning from the 5th day after the injury, was treated with 9 alkohol injections at intervals of 1 to 6 days. I am convinced that thereby I did not only prevent a panophthalmitis, but saved even perception of light and projection.

In four cases of spontaneous or traumatic *hæmorrhages in vitreo*, I could observe the beneficial action of the injection on the absorption. Smaller and larger hæmorrhages were cleared up in a much shorter time than they do when left alone. In one case a glaucoma with hæmorrhagic tendencies had been operated on. A hyphaema and a slight vitreous hæmorrhage were absorbed the first in two weeks, the latter a little slower, and the beneficial action of alkohol injections in those 4 cases was undoubted.

Exudative opacities in the vitreous body, too, are favorably influenced, as I saw in the following case: A lady, 40 years old, had had for years in both eyes a chronic iridochoroiditis with posterior synechiae and diffuse opacities in the vitreous body, which often remained unaltered for months. During these years I treated the patient by all sorts of means, hydrotherapeutic applications, sweat cures, pilocarpine injections, mild mercurials, different iodide preparations, stimulating cures, etc., and succeeded in preserving a good visual acuity in both eyes, sufficient for reading print. At one time, when the condition had remained stationary in both eyes for a continued period, I made in the left eye 6 alkohol injections during one month, and found that during this time in this eye subjectively and objectively a marked clearing of the opacities and improvement of the visual acuity resulted, while no change occurred in the right eye.

A case of *preretinal hæmorrhage* is especially noteworthy. A middle-aged man while reconvalescing from a febrile disease suddenly noticed a central scotoma before his right eye. The ophthalmoscope revealed in the region of the macula lutea a hæmorrhage of the size of 6 papillæ which had upwards an irregular outline and was surrounded by smaller hæmorrhages, while below it had a sharp horizontal limitation (inverted image.) By temporary pressure bandage and 6 alkohol injections made in about 5 weeks the largest part of this hæmor-

rhage was absorbed. During this time the horizontal line rose higher and higher, showing that this was a fluid preretinal hæmorrhage.

In a man 62 years old with compensated valvular insufficiency of the aorta, by means of iodide of potassium and 7 alcohol injections, in 2 months, a *hæmorrhagic choroiditis* was improved to such a degree that vision rose from counting of fingers to 15/70. Some 10 months later the tension in this age increased so as to necessitate an iridectomy.

Two cases of *central choroiditis* were treated with alcohol. One in a man of middle age who suffered from muscular rheumatism and mild rheumatic choroiditis. This showed itself in the left eye only through small scotomata near the macula lutea, although nothing was visible ophthalmoscopically; 5 alcohol injections, with salicylates internally, brought about the disappearance of the scotomata. A lady 60 years old, with arteriosclerosis suffered from a mild choroiditis centralis without ophthalmoscopic signs and complained especially of metamorphopsia without scotomata. Mild iodide treatment and 4 alcohol injections in the course of one month caused a very marked improvement in the metamorphopsia.

In 2 cases of *disseminate choroiditis* without known basis the disease was cut short in 3 and 5 months by means of 9 and 10 alcohol injections combined with unimportant other treatment.

I found that alcohol injections are a very important adjunct to the mercurial treatment in *sympathetic ophthalmia*, as well when used as a preventative or as a treatment of the established disease. This effect was plainly noted in the left eye of a young laborer who unfortunately gave his consent to the enucleation of the right injured eye only when the sympathetic ophthalmia broke out in the left one. This with synichesis of the iris and opacities of the vitreous body, had depressed vision to such an extent that the patient could hardly count fingers. With mercurial inunctions and other treatment a slow improvement was gained so that he could count fingers at 6 feet after 6 months. Then 17 alcohol injections in 2 months produced a further improvement so that he counted fingers at 10 to 12 feet.

Against the chorioretinal complications in *myopia* I have

made in 3 cases 5 or 6 alcohol injections with marked success and have seen that the irritative symptoms and photopsiæ were improved, the opacities in the vitreous body were cleared up, retinal hæmorrhages were absorbed, and the loss of vision was prevented.

Detachment of the retina I treated with alcohol injections in 2 cases. In the first case a traumatic hæmorrhagic detachment had occurred in the external lower quadrant of the right eye after a contusion. Pressure bandage, rest, and 5 alcohol injections brought about absorption and restitution of the visual field in the affected quadrant. In the second case a recent detachment of the upper part of the retina in a case of myopia of high degree all treatment, including alcohol injections, remained useless.

In a case of *pigmentary retinitis* in a man 30 years of age, in which during the previous 3 years vision had markedly deteriorated, and the visual field had progressively become smaller, luckily 6 alcohol injections with stimulating treatment, and a few hydrotherapeutic applications produced a standstill in the progress of the disease in the course of several months, without any alteration in the characteristic ophthalmoscopic appearances. A year later both visual acuity and visual field were found to be the same.

Finally, I treated a case of acute *retrobulbar neuritis*, which had to be looked upon as of rheumatic origin. A lady, 36 years old, had become absolutely amaurotic with severe pain in the left eye in the course of two days. Rest, an icebag to the head, catharsis and a few leeches restored within 2 weeks a limited visual acuity (fingers counted excentrically at 5 feet, with central scotoma); 5 alcohol injections, now made, increased vision in a month to counting of fingers at 10 feet. This vision remained stationary with an irregularly contracted visual field and a central scotoma. The ophthalmoscope showed progressive atrophy of the optic nerve.

EDITORIAL NOTES.

The following remarks of several contemporaries on the demand of certain opticians for recognition as hybrid physicians, have our hearty approval. The question is again agitating the State of New York and Great Britain. We hope that in the interest of the opticians themselves no such demand will be granted.

ACT TO DEFINE AND REGULATE THE PRACTICE
OF OPTOMETRY.

It is sometimes supposed that opticians have contributed to the knowledge of the world very materially in the invention of glasses in their adjustment, and so forth. As a matter of fact, the world remained without any scientific adjustment of glasses to the eye, without any exact knowledge as to their powers, until Professor Donders, of Utrecht, in Holland, a member of the medical profession, a physiologist and ophthalmologist, deduced this from a mass of information that had been gathered, not by opticians, but by members of the medical profession and other scientists including himself, and classified it so that glasses could do their important work. From that day to this the advances continue to be made by men who are educated and licensed to practice medicine. The adjustment of glasses is just as much a matter of medical practice, as the prescription for a brace for any crippled part of the body, or, as the prescription of a drug to relieve a pain. All these things require knowledge of the anatomy of the human body, a general understanding of the relations of health and disease to the functions of the body, and so forth.

Now, what are our opticians? They are men who grind glasses according to the rules laid down, not by themselves, but by the scientific teachers of the world. They sell these glasses to people who may ask for them, either on the prescription of a physician or on their own choice. The medical profession has no desire to interfere with the liberty of any person who chooses to select his own glasses from those offered to him by an optician, neither do we object to any patient going to an apothecary and asking for a non-poison-

ous drug for the relief of some ache or pain from which he is suffering. The responsibility in such cases is with himself, and not with the optician or the druggist, but what we do object to in behalf of the public, is that either one of these people shall undertake to prescribe for the patient, tell him what glasses will relieve his headache, what glasses will correct the strain on his vision, or what drug will cure his ailments. Then he has engaged in the practice of medicine, which the State of New York does not allow, unless after certain examination.

But the opticians will appear this year again with "Act to Define and Regulate the Practice of Optometry." Optometry the bill says, "is hereby defined as the employment of subjective and objective mechanical means to determine the accommodative and refractive states of the eye by using such skilled mechanical means as will determine their choice." This definition has a fatal defect in assuming that the human body is entirely a mechanical organism, whose defects can be attended to just as can those of a steam engine or an electric dynamo. (*The Post-Graduate.*)

THE OPTICIANS' "OPTOMETRY" SHOULD BE MADE ILLEGAL
INSTEAD OF BEING LEGALIZED.

The "Optical Society of the State of New York" has prepared a bill which it is seeking to have made law and it is actually asking physicians for their help in securing its passage. The first section of this bill is a definition of "optometry," which reads as follows:

The employment of any means, other than the use of drugs, for the measurement of the powers of vision, and the adaptation of lenses for the aid thereof.

Section 9 of this proposed bill makes a distinction between optometrists and "those who sell spectacles or eyeglasses on prescription from any duly qualified optometrist or physician," from which we learn much! In the letter seeking the aid of physicians there are these paragraphs:

As the measure does not invade the domain of medicine, we desire the support of all medical practitioners, believing that the compulsory education of those engaged in fitting spectacles and eyeglasses will prove a pronounced public service. . . . We want all who practise optometry to be able to recog-

nize disease for the sole purpose of urging the importance of consulting qualified physicians.

This is the rankest hypocrisy and deceit. "Optometry" practised by any but physicians should be made illegal instead of cunningly legalized. No "optometrist" can possibly "recognize disease" except after a medical education. It is as important that the treatment of diseases of the eye should be solely in the hands of medical men as that druggists should be disqualified from prescribing for other diseases. Moreover there is a double deceit in all this, for almost no spectacles or eyeglasses are prescribed by the medical man for the sole purpose of "aiding vision." Myopia is a disease itself, and astigmatism and farsightedness, if not always of themselves diseases, do produce many and profound diseases, directly and inevitably. There are no instruments of the *materia medica* more powerful for good or evil than lenses used in spectacles. The eye is the most valuable of the sense organs of the body; and its diseases and the function of vision are indissolubly bound together. The disorders of vision cannot be treated apart from the diseases of the eye, and also from the diseases of the brain and of the whole body which result from optometry good or bad, or from the want of it. Every physician should labor to make optometry illegal by any other than the physician. (*Am. Medicine*,)

THE OPTICAL SOCIETY'S BILL.

The attempt on the part of the Optical Society of the State of New York to secure legislation to legalize the acts of its members in practising medicine without the now legal qualifications is to be renewed. Its failures in former years were to be attributed in no small degree to the efforts of the State Medical Society and its committee on legislation. This year the president of the Optical Society has sent to each physician in the State a copy of the proposed act, a circular in which certain erroneous statements are made, and a postal card which it is requested that the physician sign and return. Doubtless many of these postal cards have been signed and returned by physicians who have forgotten for the time the struggles so ably waged at Albany, by our committee on legislation to maintain the standard to be required of all who shall practise any branch of medicine in this State, but who would

not willingly or knowingly hamper the action of that committee. But when our committee presents the almost unanimous opposition of the profession to this or any other bill which will tend to "let down the bars," it will be confronted by this mass of postal cards from the individual members of the profession it represents, each one of whom has signed a statement directly antagonistic to its efforts. In his circular letter the president of the Optical Society says, "As the measure does not invade the domain of medicine we desire the support of all medical practitioners. . . . We want all who practice Optometry to be able to recognize disease for the SOLE purpose of urging the importance of consulting qualified physicians." Section I. of the bill is "The practice of Optometry is defined to be the employment of any means, other than the use of drugs, for the measurement of the powers of vision and the adaptation of lenses for the aid thereof." By the "powers of vision" must be meant the functional activity of the retina as influenced by disease or malformation of some portion of the eye. The adaptation of lenses for the aid thereof can take place with benefit to the patient only when malformation is the fault, but the treatment of diseases and malformations of the eye is as much practice of medicine as treatment of the diseases and malformation of the limbs or of the internal organs, and all who practice this branch of medicine should be equally well qualified with those who devote their attention to the others. The statement of the president in his letter, that the measure does not invade the domain of medicine, is not true. If it were not for the desire to invade that domain such a bill as this would never be thought of, much less pressed year after year upon the legislature. Persons who suffer from troubles which call for attention to the eyes should be encouraged by the profession to avoid such people as those it is now proposed to license, and to consult physicians who are specialists in eye diseases, to determine what treatment should be instituted. Meantime, no effort should be spared to exclude this insidious measure. It is, in sooth, the wooden horse of Troy. Surely of it and its specious sops to the medical profession, we may well repeat "*Timeo Danaos et dona ferentes.*" (*New York and Philadelphia Medical Journal.*)

The following appears in the February number of our most recent ophthalmic contemporary, the *Ophthalmoscope*:

THE OPTICIAN QUESTION.

We congratulate Mr. W. A. Dixey, of New Broad Street, a member of the well-known firm of London opticians, on having the courage of his opinions on the vexed question of sight testing by a member of his craft. He has issued a circular letter to the leading journals of the optical trade. As an old-standing member of the Company he discusses the proposal to add the subject of sight testing to the examinations for opticians held by the Spectacle Makers' Company. He smites the whole army of pseudo-oculists hip and thigh in a letter which is admirably concise, moderate, and convincing. We have not space here to discuss the communication at length, but must refer readers interested in the matter to the original document. Take the following passage: "Three processes are involved in fitting a person with spectacles: (1) Testing the sight; (2) Measuring the face; (3) Selling the spectacles. There is also the process of making the spectacles, but I leave that out for the present. As a matter of convenience, I contend that the first belongs to the consulting room, and the third to the shop. The second can in this respect be equally well conducted in either." That is a crisp enough statement, and Mr. Dixey's style is equally to the point when he comes to deal with the actual manufacture. "On the wholesale and manufacturing side of the trade," he says, "there has been a lack of technical knowledge and a want of enterprise, which have had the natural result that we are inundated with a quantity of foreign goods, which could just as well—nay, better—have been made in England." Bravo! Mr. Dixey, the wholesome English breed of opticians yet lives and breathes among us. Heaven only knows why on earth a self-respecting mechanic and tradesman should want a number of letters after his name and a shop-window decoration of diploma, anatomical models, and optical apparatus, instead of the articles it is his trade to make and sell. Perhaps were Thackeray alive he might solve the problem in an additional chapter to his "BOOK OF SNOBS."

ABSTRACTS FROM MEDICAL LITERATURE.

BY W. A. SHOEMAKER, M.D.
ST. LOUIS, MO.

THE TREATMENT OF LACRIMAL STRICTURE.

J. Wilkinson Jewey (in a paper read before the Tri-State Medical Society of Georgia, Alabama and Tennessee, October 13-15, 1903, *Medical Record*, Dec. 19, 1903), discusses the methods of treating this disease, referring especially to the passing of large probes (as high as No. 16, as recommended by Theobald,) a method that, in his experience has left much to be desired. The principal objections to this method are: (1) It is necessary to split the canaliculus for its entire length; (2) the entrance of the canaliculus into the sac is tremendously dilated. The author illustrates and describes an instrument that he thinks overcomes these objections, at least in part, and possesses other advantages. He says:

The principle of the instrument is simply that of a wire bent double upon itself. When traction is exerted upon one free end, the other being held firm, a buckling results. This buckling accomplishes the dilation. The instrument can be introduced as easily as a No. 1 or No. 2 lacrimal probe, and when *in situ* can be dilated to any desired extent, thus avoiding the trauma and irritation necessarily involved in forcing a large solid dilator into the passage. The greatest pressure of dilatation occurs at the point of the greatest resistance in the canal, which, of course is the location of the stricture. While the instrument is in place and the wires are separated, the passage is open for syringing, or even for applications by means of a cotton-tipped probe. This is possible with no other form of dilator hitherto devised. By this means, with every fold and crevice of the mucous lining on the stretch, the entire surface is accessible to flushing and medication.

With this instrument it is often feasible to dilate lacrimal strictures to any desired extent without splitting the canaliculus. In this way the surgeon can avoid many of those unfortunate cases in which even after the stricture has been re-

lieved by the old method, epiphora persists on account of the lost power of capillary attraction and suction due to splitting of the canaliculus. Were this last the only advantage the dilator possessed it would still be of inestimable value to the ophthalmologist.

The instrument is provided with a sliding collar which can be pushed down to the punctum lacrimale in those cases in which splitting is unnecessary, so preventing the possibility of rupturing the punctum or canaliculus in the process of dilating the remainder of the canal. The wire part of the dilator is slightly malleable and can be bent to any desired curve.

In using the dilator I practice the following technique: After instilling adrenalin and cocaine into the eye, the attempt is made to pass through the lower canaliculus a No. 1 or No. 2 Bowman's silver probe. If this cannot be done after repeated trials, the punctum is incised for about 2 mm., and another effort is made to pass the small probe. If this be still impossible then the canaliculus must be split in the usual way. With a small syringe and silver canula adrenalin, cocaine, and boric acid, in separate or mixed solution are injected into the sac and as far down the canal as possible.

After a wait of five minutes for these agents to take effect, the dilator with a little simple aseptic or antiseptic lubrication, such as carbolated or borated vaselin, is passed through the canal, the way having first been gently explored by the small Bowman probe. The dilator being held by the ring and barrel with the left hand, the right hand turns the thumbscrew to spring the wires apart. The amount of dilatation can easily be gauged while the instrument is in position by means of a scale on the barrel.

The dilatation should be effected slowly, and a little at a time, with waiting intervals between the turns; when it is done slowly and gently little pain is caused. Having been sprung to the desired extent (the amount of spreading being increased a little at each successive sitting, these being about forty-eight hours apart), the instrument should be allowed to remain in the passage for ten or fifteen minutes. Then the thumbscrew is rapidly reversed, the instrument is withdrawn, and the passage is syringed with some suitable antiseptic solution. In the intervals between sittings, the patient is given the usual antiseptic wash for the eye.

A CONTRIBUTION TO THE STUDY OF VISUAL DISTURBANCES
IN BRAIN INJURY.

William E. Gamble (*Jour. A. M. A.*, Jan. 23,) had a case of brain injury under observation during a period of four years and suggests the following conclusions:

1. A cortical lesion the size of a 32-caliber (!) bullet, involving the greater part (posterior) of the third and fourth left temporal convolutions and bruising of extreme anterior end of inferior occipital convolution, and a subcortical lesion penetrating the middle occipital convolution at the same level, produces verbal amnesia, especially for names of objects seen and having been seen, particularly those which have proper names (concrete nouns), and for names of colors, especially names of special shades, such as bismarck-brown, etc., (amnesic color blindness) and pure word-blindness (alexia), which may be in part a form of visual verbal amnesia.

2. Verbal amnesia is a result of a lesion in the cortex of the third and fourth temporal convolutions, left hemisphere and injury to cortex of anterior end of inferior occipital convolution.

3. The amnesic color blindness and alexia result from subcortical lesion in left middle occipital convolution.

4. The reacquirement of these functions in a man 28 years of age is a slow and tedious process of education of the specialized though undeveloped cells of the right hemisphere, requiring years for even partial accomplishment.

5. Injury to the optic radiations of Gratiolet may produce negative scotoma, contrary to the teaching that such a lesion produces positive scotoma.

6. Primary atrophy of the optic discs occurs in lesions of the left temporo-occipital region.

STEREOSCOPIC EXERCISES.—WITH A SERIES OF PICTURES TO
BE USED IN AMBLYOPIA AND SQUINT.

Albert B. Hale (*Jour. A. M. A.*, Oct. 10th, 1903), feeling that the stereoscopic views now in use are for the most part too complicated for successful use by the patient at home, has published a series of American pictures, simplifying them as much as possible. He says:

“Stereoscopic exercises must illustrate five stages.

“1. Simple tests to measure what the one eye or both

eyes together can do. This I have embodied in Series A (1, 2, 3, etc.), which can be extended as far as may be desired.

“2. Simple tests of the ability of each eye to see its own field and to retain this impression while the other eye also sees. This is Series B, which grows somewhat more difficult from number to number.

“3. Tests in which each eye sees what it at first takes to be the same picture, but in which the half for each eye lacks some detail present in the half for the other eye; these halves are probably fused, or the patient thinks they are, but a failure to fuse can be detected by the omission from the patient's description of one or more details. This is Series C.

“4. Tests in which not only is there an instinctive stimulus to fusion, but also the added factor of depth, for the figures are so arranged that each eye obtains a picture presented to it at an angle differing from the angle of the other eye, and the completed picture seen with both eyes acting together should be that of a solid body, i. e., there should be a perception of depth in addition to fusion; stereoscopy, the perfected act of binocular single vision. This is Series D.

“5. Tests by means of pictures of what we habitually see in the outer world, in which I have introduced two ordinary photographs from life and a simple catch card for reading, in which each eye is deprived of some letters visible to the other eye, so that both eyes must be used together and simultaneously before the story can be fluently read. This is Series E.

“These charts may be placed in the hands of any child or adult, to be used at home and frequently, with regular reports to the ophthalmologist of what progress has been made. The pictures are scientific, clear, readily understood, handy and cheap. Any simple stereoscope of the shops may be used. The whole value of stereoscopic exercise depends on repetition, as it is only by this continuously repeated stimulation that the habit of fusion may be formed and perpetuated.”

THE TREATMENT OF DACRYOCYSTITIS BY EXTIRPATION OF THE LACRIMAL SAC.

Etienne Rollet (*The Ophthalmoscope*, Dec. 1903), advises the removal of the sac: (1) In simple dacryocystitis, when it is old and rebellious, when the introduction of probes is

very painful or impossible, and when a speedy cure must be effected. (2) In cases of lacrimal tumor with mucous or purulent contents. (3) Chronic lacrimal fistulae. (4) Tuberculous dacryocystitis. In phlegmonous dacryocystitis the operation is least indicated, and advisable only after the inflammation has subsided.

The author has removed fifty sacs. Twenty-seven cases were watched for periods ranging from six months to seven years. Eighty-nine per cent. were cured. In 67 per cent. lacrimation did not exist; in 22 per cent. it was present only when the patient was exposed to the wind or cold; in eleven per cent it persisted.

Three theories have been advanced to account for the good results in this class of cases:

“(1) That the lacrimo-nasal canal becomes formed anew, a view that I have opposed on both clinical and experimental grounds;

“(2) That the watering of the eye disappears with the cause of the hypersecretion, namely, the lacrimal inflammation. This theory explains the disappearance of the lacrimation often witnessed immediately after the removal of the sac, or, in other words, after suppression of the suppuration causing the lacrimal irritation;

“(3) That the operation is followed by an atrophy of the lacrimal gland. This theory explains those cases where the watering of the eye persists for some little time after ablation of the sac. An experiment performed by me in 1896 upon a dog, showed that an atrophy, macroscopical and microscopical, of the lacrimal glands followed five months after extirpation of the animal's lacrimal sac. Tscherno-Schwartz in 1901, reached the same results after experiments upon rabbits.”

PAMPHILETS RECEIVED.

“Suggestions for a Uniform Nomenclature of the Movements and Motor Anomalies of the Eye.” By A. Duane, M. D.

“Aplasia of the Papillæ and Retinal Vessels, with a Peculiar Anomaly at the Macula in Eyes Otherwise Normal.” By A. Duane, M. D.

BOOK REVIEWS.

DIE AUGENAERZTLICHEN OPERATIONEN (OPERATIONS ON THE EYE). By PROF. DR. H. CZERMAK. Part XV. Wien, 1904. CARL GEROLD'S SOHN. Price 2 marks.

This is the continuation of the chapter on operations on the lens noticed in our last issue. Our high opinion of this work remains unchanged.

DISEASES OF THE EYE. By L. WEBSTER FOX, A.M., M.D. 5 Colored Plates and 290 Illustrations. [New York and London, 1904: D. Appleton & Co.]

This is a thoroughly practical treatise on diseases of the eye which is not only complete, but bears the mark of a teacher on every page. Especial attention is naturally paid to the several points with which the author's name is more prominently connected. The illustrations are mostly good; the print is large.

BIOGRAPHICAL CLINICS. VOLUME II. THE ORIGIN OF THE ILL HEALTH OF GEORGE ELIOT, GEORGE HENRY LEWES, WAGNER, PARKMAN, JANE WELCH CARLYLE, SPENCER, WHITTIER, MARGARET FULLER OSSOLI, AND NIETZSCHE. By GEORGE M. GOULD, M. D. [Philadelphia: 1904. P. Blakiston's Son & Co.]

The continuations of the author's studies concerning the ocular defects and their influences on the life and character of individuals of literary prominence are introduced by a severe lecture to the critics of the first volume. The author is so firmly convinced of his deductions, that he cannot accept any other views than his own. A special chapter contains "68 reasons why glasses did not give relief," which while it has been previously published, is well worthy of studying again and again, as it contains numerous points of great importance.

The book is full of interesting and profitable reading, although in our opinion the author in arguing his point goes decidedly too far, and must be taken *cum grano salis*.

ALT.

PAMPHLETS.

"Correct Breathing." By J. M. Brown, M. D.

"Lacunar Tonsillitis." By J. M. Brown, M. D.

"A Simple Test for Stereoscopic Vision." By F. H. Verhoeff.

"Stenosis of the Lacrimonasal Duct." By J. C. Buckwalter, M. D.

"Medical and Surgical Report of St. Luke's Hospital, 1903." Chicago.

"The Systematic Use of Cylinders in Making the Shadow Test." By A. Duane, M. D.

"The Various Methods of Mounting Gross Eye Preparations." By C. A. Wood, M. D.

"Vésicule Flottante du Vitré (Vesicle Floating in the Vitreous Body)." By Dr. Uribe Troncoso.

"A Hitherto Undescribed Membrane of the Eye and Its Significance." By F. H. Verhoeff, M. D.

"The Value of the Screen-Test as a Precise Means of Measuring Squint." By A. Duane, M. D.

"Eine Graduelle Plastische Tenotomy, (a Graduated Plastic Tenotomy)." By F. H. Verhoeff, M. D.

"The Window-Resection Operation for Correction of Deflections of the Nasal Septum." By O. T. Freer, M. D.

"Congenital Orbital Sarcoma of Endothelial Origin in an Infant. Operation and Preservation of Globe." By Th. Frank, M. D.

"Ocular Examination as an Aid to the Early Diagnosis of Multiple Sclerosis, with Report of a Case." By John Green Jr., M. D., and S. I. Schwab, M. D.

"Some Remarks on the Use of Mallory's Phosphotungstic Acid Hematoxyline, and a Note on the Musculus Papillæ Optici of Nicolai." By F. H. Verhoeff, M. D.

"La Composition de l'Humeur Aqueuse dans les cas de Cataracte Sénile (the Composition of the Aqueous Humor in Cases of Senile Cataract)." By Dr. Uribe Troncoso.

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ORIGINAL ARTICLES.

TRAUMATIC SUBLUXATION OF THE LENS; SECONDARY GLAUCOMA; SUCCESSFUL EXTRACTION, WITH PRESERVATION OF VISION.

By THOMAS R. POOLEY, M.D.

NEW YORK, N. Y.

AS is well known, traumatic dislocations of the lens into the vitreous, whether partial or complete, are fraught with danger for the integrity of the eye as they entail secondary consequences which may be extremely disastrous. The worst complications are those arising from implication of the uveal tract. Increase of tension, also, is especially liable to develop as a result of luxation of the lens.

A variance of opinion exists as to the best way of dealing with such cases. There can, however, be no doubt that where symptoms of iridocyclitis or secondary glaucoma are caused by a malposition of the lens, especially if it be cataractous, the best course to pursue, if it is possible, is to extract the lens.

The reason for reporting the following very interesting case, lies in the successful effort to extract such a cataractous lens in an eye in which secondary glaucoma had existed for some time, unrelieved by other measures, with a preservation, of some degree, of vision.

The patient, a man 69 years of age, who had already been under my observation with immature cataracts in both eyes,

on Aug. 5th, 1902, injured his left eye while chopping wood. After the temporary pain occasioned by the injury had disappeared, he had no symptoms of any further trouble until Dec. 29th, when he first came to my clinic. The eye then presented the usual symptoms of acute glaucoma: a wide, immovable pupil, circumcorneal injection, some ocular chemosis, and swelling of the lids, \div T. The lens was dislocated obliquely downwards, its upper edge looking somewhat backward and its lower edge forward. The anterior chamber was very shallow; no details of the fundus could be made out. Vision was reduced to counting fingers at 10', and the field restricted in the usual manner. Leeches were applied to the temple and one-half per cent. solution of eserine ordered to be put in the eye three times a day.

On February 8th, 1903, he again appeared at the clinic, the pain not having been relieved by treatment. An operation was therefore proposed.

With the patient fully under ether, an attempt at iridectomy was made, but immediately upon the removal of the keratome vitreous presented, and it was found impossible to seize the iris. Further attempts were therefore abandoned, and the operation, which was virtually an anterior sclerotomy, completed. The following day the pain was relieved, there was less injection and Tn. The healing was perfectly smooth.

On Feb. 14th, he was discharged, tension still normal, no injection of the eye, vision equaled 15_{40} . The result of this operation was a complete relief of the glaucomatous symptoms for some time. But as the displaced lens became more and more opaque, there was a gradual return of the glaucomatous symptoms, which were relieved by the use of eserine, pilocarpine and cocaine. Nevertheless, the tension of the eye became more and more increased, and vision was reduced to seeing movements of the hand; this was supposed to be partly due to ripening of the cataract.

October 7th the eye had again become very painful, the tension was increased, and vision reduced to perception of light. An attempt to remove the lens was therefore determined upon. Before performing the operation, however, acting upon the suggestion of my colleague, Dr. E. B. Co-

burn, I made a posterior sclerotomy, with a view to reducing the tension and diminishing the danger of loss of vitreous or intraocular hæmorrhage by the sudden release of tension when the lens was removed. The eye being thoroughly cocaineized, under strict aseptic precautions, was seized by fixation forceps and drawn strongly inwards. A Beer's knife was then thrust through the conjunctiva and sclerotic, about 7 m.m. behind the cornea, between the superior and external recti muscles, directed towards the center of the vitreous, and as it was withdrawn, turned slightly on its axis. The escaping vitreous was very fluid.

This operation was followed by no reaction or untoward symptoms, and the healing was uneventful. Tension became very much reduced, the anterior chamber rather deeper, and three days later, October 10th, extraction of the lens was performed. A large section was made with a very narrow Graefe's knife, comprising almost half the corneal circumference. Notwithstanding the shallow anterior chamber, the section was completed without engaging the iris except at its upper periphery, just as the section was completed. Immediately upon the completion of the section, it was noticed that the upper edge of the lens presented itself, and slight pressure with the fixation forceps sufficed to extrude it, which was accomplished without the loss of vitreous. The fixation forceps were now released, the speculum removed and the operation completed. The wound gaped considerably, but came into perfect apposition by merely allowing the aqueous to collect. No attempt was made to remove some cortical remnants which remained in the anterior chamber. There was no reaction from the operation except a very marked striped keratitis and rather slow healing of the wound. The patient was discharged on the 10th day with slight remaining circumcorneal injection, with some striped opacity of the cornea, normal tension, and quantitative perception of light.

November 30th. The eye is nearly white. There is a cystoid scar. Tn. Fingers are counted on the temporal side. No details of the fundus can be made out on account of dense capsular obstruction, but as there is a good visual field, the prospects of restoring vision by a subsequent discission, are not bad.

Remarks—So far as I am aware, posterior sclerotomy, as an initial step to the extraction of a glaucomatous cataract, has not been heretofore practised, although, of course, it is indicated when iridectomy and anterior sclerotomy have failed, and has been practised for this reason. It, therefore, seems to me very desirable to extend its use to cases similar to the one here reported, and the credit of the method—if it should prove useful—should be accorded to Dr. Coburn. The writer is fully convinced that the successful issue of the case here reported depended upon reducing the extreme tension by this procedure, thus rendering the subsequent extraction both easier and safer.

A CASE OF NON-TRAUMATIC SEROUS CYST OF THE IRIS.

By THOMAS R. POOLEY, M.D.

NEW YORK, N. Y.

HENRY B. SWART, a young man of 34 years, consulted me at the clinic, May 29th, 1903, about a growth on the iris. He was positive that the eye had never been injured in any way, and there was no evidence of trauma. As long ago as twelve years, a small spot on the iris, had been observed both by himself and others, which he said had grown steadily but very slowly until it had reached its present size. About four weeks before I saw him he had consulted an oculist in the town where he resides, who made the diagnosis of "rupture of the iris." The day before he came to the clinic he observed a hæmorrhage of the conjunctiva on the nasal side. At no time had there been any pain, only a slight feeling of discomfort, and no disturbance of vision.

Status Presens.—A large subconjunctival hæmorrhage covers the whole nasal side of the right eye. The pupil is somewhat encroached upon at its lower border. The iris presents a dark-colored mass at its lower temporal side which, on closer inspection by oblique illumination, is seen to be a cyst in the transparent anterior wall of the iris, showing a few striations. The cyst extends from the sclero-corneal margin nearly to the upper margin of the pupil, but leaving a very narrow slit above 4 or 5 m.m., the edge of the iris being

slightly everted, showing the black pigmentary posterior surface of this membrane. The tumor measures about 5 m.m. in both diameters, is somewhat globular in form, but flattened against the cornea. Through the pupil the cyst seems to project slightly backward. Fundus normal. Tn. V = $\frac{20}{20}$ with + 1D c. axis 90°.

Operation.—Cocaine anæsthesia. Under careful aseptic precautions a narrow Graefe's knife was passed from the horizontal meridian downwards and inwards over the tumor and made its exit a little to the nasal side of the corneal centre. Tumor not injured by the section. Mathius' iris forceps were then introduced, but neither the iris nor the cyst could be grasped; nor did it collapse until the fourth attempt when, on introducing the forceps again, the iris was seized, drawn and cut off, including, no doubt, the greater part of the anterior wall of the cyst, for upon repeated attempts it was impossible to obtain any more. A spatula was now used to bring the edges of the wound together and the eye bandaged. There was no infection, nor other untoward symptoms. The patient was discharged on the fifth day after the operation and allowed to go to his home in a distant city.

November 24th, the patient came to show me his eye which has given him no trouble since the operation, and he can see even better than before this was performed. There was a small coloboma downwards and outwards. The iris is engaged in the scar; on the inner side of the coloboma there is a brownish pigment spot about 4 m.m., projecting upwards into the anterior chamber and to the inner posterior side of this a whitish opacity is noticed which, by careful illumination seems to have a transparent wall, (most likely a beginning re-formation of the cyst). The eye is absolutely free from all irritation, and vision with the same correction, is $\frac{20}{15}$. The examination of the small piece of iris removed, made by Dr. E. B. Coburn, shows only rarefied iris tissue and no trace of the epithelial lining of the inner cyst wall.

Remarks.—It is to be feared that the failure to remove all the cyst wall may give rise to a recurrence of the growth, and that another operation will be required. It is worthy of note that the growth of the cyst had given rise to so few unfavorable symptoms, either in disturbance of vision or irri-

tation of the eye. The large subconjunctival hæmorrhage was an unusual feature, but whether or not it was caused by the cyst, is difficult to say.

Another point of interest in the case, is the spontaneous origin of the cyst. Non-traumatic cysts of the iris are of very rare occurrence. At least, three-fourths of the cases develop after a penetrating wound of the eyeball as evidenced by both the history and the presence of a cicatrix. The absence of all such history, and of any proofs of trauma, in this case, place it in this rare category.

While it is beyond the scope of this paper to go into the literature of the subject, I will nevertheless, briefly state the views held as to the origin of these non-traumatic cysts of the iris. Schmidt-Rimpler has suggested that some of the non-traumatic cysts may arise from the closure of the crypts normally present upon the surface of the iris. An accumulation of fluid is then assumed to take place so that a retention—or, more correctly, perhaps, an exudation-cyst is formed. It has also been surmised that some of the congenital cases, (and mine cannot certainly be taken out of this class) may be accounted for by fluid that has collected between Descemet's membrane and a pupillary membrane—(Giraud-Teulon). Lastly, Berry believes that the serous cyst is a kind of cystoid degeneration of the iris, leading to the formation of a diverticulum at the angle of the iris.

JUVENILE CHRONIC GLAUCOMA.*

By H. TRUC, M.D.

Translated by Adolf Alt, M.D.

MISS X., 22 years old. Father and mother were first cousins. Their health is good and vision normal. The paternal great-grandmother was blind when she died. A younger sister, 10 years old, is well but has only two incisors. A brother, 26 years old, for three years, a little before and more especially since his marriage, has been afflicted with Basedow's disease. He has a high degree of exophthalmus of both eyes, tachycardia, pronounced goitre, trembling of the hands and nervosity. However, the affection seems to get better.

**Revue générale d'Ophthalmologie.* January 1904.

Our patient has always enjoyed good health. Her dentition was laborious and each dental eruption was accompanied by bronchitis. She had the measles. Since her 14th year she menstruates regularly and normally. She is of middle height, blond, fat, her flesh firm. She is intelligent, active, very punctilious.

Her usual vision in both eyes has been rather feeble, but there was no lesion, until the previous year. For about a year the vision deteriorated in the right eye and for a few months in the left one.

When I first examined her in February, 1903, I found hypertonus in the right eye, atrophy with excavation of the papilla, and vision = 0.1 with — 3D. \bigcirc 1D. c. ax. 90°; the left fundus was normal, vision = 0.5 with — 3D. \bigcirc — 2D. cyl. ax. 165°.

The glaucomatous state being manifest, I ordered pilocarpine, massage, laxatives and a relative rest for the eyes. Lately my former assistant, Dr. Delord, of Nîmes, had prescribed the glasses which corrected her myopia.

Since her visual condition grew worse the patient again consulted me last October. V. R. E. = $\frac{1}{x}$, T + 2, almost no anterior chamber, periorbital sensations of weight, papilla atrophic and excavated. L. E. hard, anterior chamber much diminished, slight excavation of the papilla, arterial pulsation, visual field nasally contracted. Pulse 72, no cardiac trouble, no arteriosclerosis, no goitre, etc. The glaucoma had signally progressed. Laxatives, sodium bromide, large doses of pilocarpine, massage. Under the influence of the miotic* the conditions of the right eye are not altered, but the left eye retains its vision.

On account of the gravity of the situation I proposed a double iridectomy upwards, with or without anæsthesia. The operation was performed on both eyes without general anæsthesia, with the assistance of Dr. Delord and my assistant P. Chavernac. The eyes were clean even under a trial bandage and, thanks to 20 grammes of bromidia, the patient was extremely docile.

The iridectomy had to be made first on the left eye, the better one, because it is known from experience that the first

*Truc and Cauvin, Arch. d'Oph. 1900; Cauvin, Th. Montpellier, 1900; DeWecker, Soc. fr. d'Opht. 1901.

operation is usually better born than the second one at the same sitting. On æsthetic and visual grounds it had to be made upward. Finally on account of the hypertonus and the extreme smallness of the anterior chamber I had to employ a narrow von Graefe knife and to make a rather small incision. At another occasion I have indicated that contrary to the still classic opinion of von Graefe, it is useless in glaucoma to make a very large excision of the iris.

In order to prevent further complications, I also desired to make a small conjunctival flap. The iridectomy on the left eye was very simple, except that at the nasal angle of the sclero-conjunctival wound a point-like incarceration of the iris occurred which could not be reduced. The iridectomy on the right eye presented no particular incident. Immediately after the operation the eyes were very hard, $T + 2$.

The eyes were bandaged with the usual moist pads held by collodion.* Rest in bed, fluid nourishment, bromidia and laxatives were ordered.

No pain was noticed except during the first few hours. Sleep was normal. Simple nourishment.

The bandage was changed on the fifth day. The condition of the eyes was perfect, no secretion, no pain, no injection; but the anterior chamber was not re-formed, neither in the right nor in the left eye and there was still hypertonus, $T + 1$.

This condition lasted for some time, till in about a month, first the right and then the left anterior chamber became re-established.

In the middle of November, when the wounds were perfectly cicatrized, I found a slight hypertonus, the anterior chamber shallow, pupil regular, media normal and atrophy and excavation of the papilla in the right eye: the same conditions as before the operation in the left eye but no excavation. V. R. E. = $\frac{1}{\infty}$. V. L. E. = 0,6 with $-4D \subset -2,5 D$. c. ax. 180° . The visual field for white and colors was enlarged.

This observation of a case of simple glaucoma is important on account of its rarity, the rapid progress of the optic atrophy, the consanguinity of the parents, and perhaps, also the exophthalmic goitre in the older brother.

*These bandages, which I have used for many years, give entire satisfaction to the patients and myself.

The lesion seems to have been developed in less than two years, first in the left, then in the right eye.

Father and mother are first cousins. The brother has been afflicted with Basedow's disease for three years, true in the way of healing; yet, he was attacked at the age in which the young lady was affected with glaucoma, and his disease was aggravated by an untimely marriage.

We find an important pathogenic link between the glaucoma and Basedow's disease in a possible sympathetic affection. Would not, from a therapeutic standpoint, a sympathectomy be the best remedy in both of these cases?

The rarity of the case adds to its interest. Aside from the cases of secondary glaucoma and hydrophthalmic glaucoma, which we encounter quite frequently in children and adolescents, similar cases remain exceptional.

Yet I have a distinct recollection of two other young patients affected with chronic glaucoma. The first was a lady, 20 years of age, who since infancy had retinitis pigmentosa with slight hyperopia. There was considerable hypertonus ($T + 2$) in both eyes. $V. L. E. = \frac{1}{\infty}$; $V. R. E. = 0.1$. Slight improvement under miotic treatment. Iridectomy was proposed and refused.

The second patient was a young man, 19 years of age, with high myopia (20 D.) in both eyes, with detachment of the retina in one and enormous staphyloma in the other. An iridectomy had been proposed in vain. Blindness very quickly became complete.

Still, cases of chronic glaucoma in young people remain nevertheless exceptional observations.

Priestly Smith gives in his statistics a proportion of 0,5 to 1%.

Yet, in the literature at my disposal I can find only two cases by Lange cited by Panas,* one case by Ayres† and one case by Alt.‡ Lange's patients were a young girl and a young man. In Alt's case it was a girl 13 years of age, myopic, who had an attack of glaucoma with $+ T 2$ after the instillation of a drop of atropine solution. Finally, Ayres' patient was a young girl, of 16 years, in good

**Traité des maladies des yeux.* Vol. I. p. 503.

†*Amer. Journ. of Ophth.* April, 1899, and *Révue générale d'Opht.* 1900.

‡*Amer. Journ. of Ophth.* Sept., 1899, and *Révue générale d'Opht.* 1900.

health, myopic, in whom a chronic simple glaucoma had destroyed nearly all vision in one eye, and in the other had reduced the visual acuity to 0.9, with a considerable contraction of the nasal part of the visual field. Eserine had only a temporary effect. In the left eye an iridectomy re-established normal vision.

It is remarkable that nearly all of these glaucoma cases, as ours likewise, are myopes; and this is another interesting point, since myopia can result from an absolute excess of tension (direct glaucoma) or from an insufficiency of resistance in the posterior part of the sclerotic (indirect glaucoma). Perhaps, it is necessary in these cases to examine especially for circulatory affections and, like Abadie, at once to make sympathectomy.

THE HEREDITARY ELEMENT IN CATARACT.*

By B. L. MILLIKIN, M.D.

CLEVELAND, O.

Prof. of Ophthalmology Western Reserve University, Ophthalmic Surgeon to Lakeside Hospital, etc.

THAT heredity plays an important role in the development of cataract has been known for many years. The literature of the subject, however, is not extensive, not so much so as would seem that the subject would warrant. An occasional instance only of families affected with cataract through two or more generations has been found, a few of these being very striking. Most interesting are the reports of Dyer, Thompson, Dickey, Becker, Green, Berry, Fukala, Fromaget, Arlt and others. In many of these reports the cataracts have been congenital, in some they develop in early life, from three to five or ten years of age, in others in youth, coming on at a certain definite period, in various members of a family, while in still other families the cataracts are always of the senile type. No special form of cataract predominates largely in these various reports which I have been able to examine.

My own experience has to do with at least three families in which the hereditary tendency to the formation of cataract is manifest. It has seemed to me a brief report of these is

*Read before the Section of Ophthalmology, Otology and Laryngology, Cleveland Academy of Medicine, January 29, 1904.

not without interest. In two of these families, cataracts were present in at least three generations, and in one in two generations. I shall give brief notes of these three families in the order in which they came under my observation.

The first case was that of Garfield M., *Æt.* 8 years, a well developed boy who had had fairly good vision as a child until about six years old, when his sight began to fail. When examined in May, 1888, both eyes showed fully developed cataracts, the entire lens being opaque, of a white color, and uniform appearance. There were good light perception and projection. Early in June, 1888, both eyes were operated upon by discission. The right eye-ball was small, and though operated on more than once, no satisfactory result was obtained, although the pupil was fairly clear, there being evidently some congenital defect, together with a strabismus. The left eye recovered perfectly, with a good clear pupil. Testing the refraction in December, 1888, it was found that with + 16.00 D., $V. = \frac{6}{15}$. Examined again in August, 1900, it was found that with + 14.00 D., $V. = \frac{6}{6} +$. and with + 18 D., he was able to read any ordinary print with ease. He has been able to go to school with satisfaction, and has performed the work of a farmer perfectly well. With the exception of the eyes, this young man is a well developed, healthy individual in every way.

On August 21, 1900, June M., *Æt.* 13, a sister of the above, came to my office with the following history: The sight of the right eye began to fail four years previously, and failed rapidly, so that there was only light perception since. The left eye began to fail three weeks before her visit, and failed so rapidly that within a few days she could see only enough to avoid large objects in walking. At the time of her visit she had only light perception in each eye. The patient was an unusually large, well developed girl in every way. The right eye showed fully developed white cataract, of uniform appearance, while the left showed a less dense lens. The eyes were well formed and apparently in normal condition otherwise. Both eyes were operated upon with needles and with a good clear pupil in each, two operations having been performed on each eye. Practically there was no irritation after either operation, both eyes having been operated on at the same

time. After recovery from the operation, testing the refraction gave the following result: O. D. with + 11.00 D. \ominus + 2.00 D. cy. ax. 90° , V. = $\frac{6}{12}$ +. O. S. with 11.00 + D. \ominus + 3.00 D. cy. ax. 90° , V. = $\frac{6}{12}$ +.

With + 2.00 D. added to the above for bifocals, she has been able to do school and other work with comfort. These two were the only children in this family. On investigation it was found that the mother of these children had cataracts of both eyes as a girl, and had been operated upon successfully, while the latter's mother gave a similar history of being operated upon as a young girl, also successfully.

The next family which I saw was a Swedish family, living in Ashtabula, Ohio. The first patient seen in this family was Clara W., Æt. 9 months, who was brought to my office on May 13, 1890, having double congenital cataracts. She was a strong, healthy looking baby and in every way well developed. In addition to the cataracts there was convergent strabismus. On May 14, 1890, under ether a needle operation was performed in each eye, the lenses were both quite hard, especially the nuclear portion, so that the needle penetrated with some difficulty, and the lenses seemed small. There was little reaction afterward. On the 20th, six days later, the eyes were entirely quiet, but the right showed a dislocation of the lens into the anterior chamber. It was thought wise to remove this on account of possible danger from pressure on the iris. On the 22nd of May, under ether, an incision was made upward with a Graefe knife, and the entire lens removed with a wire loop, with no accident. A prolapse of the iris was replaced with the spatula, leaving a clear round pupil. Eserine was instilled, and the eye bandaged. The dressings were all removed on the sixth day, showing a clear round pupil. The patient left for home that day. On June 20th, the left eye was needled the second time, from which the patient made a good recovery.

The second child, Hilda W., Æt. six months, was examined on January 3, 1893, this one also being a well developed baby, with nothing abnormal except the eyes, both of which had congenital cataracts, involving the entire lens. Both of these children were girls, in fact all the individuals affected in this family, so far as ascertained, were females.

The mother of both these children had had double congenital cataracts, operated on in Sweden, and she informed me that she had a sister, who had double cataracts, and had been operated on at six years of age, she dying within six months after the time of the operation.

Dr. Baker has informed me that he operated on the second child, Hilda, of this family when she was five or six years old, successfully. He also informs me that the grandmother of these two children had the same disease and was operated on in Sweden, making therefore, three generations of congenital cataract, with five individuals all affected. There were only the two children in this last generation. So far as could be ascertained all the individuals were strong healthy persons with no other defects.

The third family with cataracts were Germans, the mother being unable to speak much English. Three children of this family, with the mother, appeared at the Lakeside Hospital Dispensary on July 9, 1902. These were Alma H., Æt. 9, Arthur H., Æt. 12 and Ella H., Æt. 15. The following history was obtained: The mother was 44 years old, and had good eyes, the father was 46 years old and had been operated by Dr. Baker five years previously for cataract, first in one eye and then in the other. In this family there were seven children. The first two, boys, had good eyes, while the youngest, also a boy, had good eyes. The other four, three girls and one boy, all had congenital cataracts. The day after the examination of these three, another daughter, Anna H., Æt. 17 years, was brought in showing the same defect. The mother and six of the children were examined by my assistant, Dr. Bruner. Whether the father's was a case of congenital cataract or not it is impossible to say. He had, however, always had poor eyes, and after the operation it was found he had a considerable myopia, together with some choroidal changes. The children had congenital central opacities of the lens, varying somewhat in shape and size, producing greater or less disturbance of vision and incapacitating all of them from doing much reading except with very large type. The vision varied from $\frac{3}{60}$ to counting fingers at one foot. The eyes were well formed and all the children were large, robust and well developed.

Alma and Arthur were first sent into the hospital and operated upon, one eye at a time. Then all four were sent in and all operated on the same day, one eye in each individual. Up to the present time Alma and her brother have had both eyes operated on, and Ella and Anna have had each one operated on. All of them were successful and none of them had much irritation after any of the operations. The refraction of the eyes after the operation was as follows:

Alma— + 11.00 D. each eye, V. = $\frac{6}{60}$.

Arthur— O. S. + 6.00 D. \bigcirc + 2.00 D. cy. ax. 60° , V. = $\frac{6}{21}$.

O. S. + 5.00 D. \bigcirc + 2.00 D. cy. ax. 75° , V. = $\frac{6}{21}$.

Ella— O. S. + 7.00 D. \bigcirc + 1.50 D. cy. ax. 105° , V. = $\frac{3}{60}$.

Anna— O. S. + 10.00 D. \bigcirc + 2.00 D. cy. ax. 90° , V. = $\frac{6}{30}$.

It will thus be seen that two of the children were somewhat nearsighted. In all of them the pupils were black and clear, and as the tests were made very shortly after recovery from the operations no doubt a careful refraction later on will give better results so far as the testing with letters is concerned. In a sense these patients must learn how to see and interpret. The improvement of vision is well illustrated in the case of the first patient of the series, where after ten or more years his vision had increased, with correction from $\frac{6}{15}$ to $\frac{6}{6}$.

In this series of cases there are reported fourteen individuals, the subjects of hereditary cataract. Of the fourteen three were males and eleven females. In two of the families the line of descent was through females and in one from the father. As to nationality, one was American, one Swedish and one German.

A word as to the operation. There is nothing original in this. For some time I have followed the rule of using a single needle in performing the first operation on cases requiring dissection. With this the lens matter itself is pretty well stirred up, without too extensive damage to the anterior capsule. At the second operation two needles are used. At this time the capsule and lens matter are thoroughly torn apart in the pupillary area. Generally I find that a large portion of the lens matter has been absorbed away after the

first needling, and the free tearing of the capsule and remaining lens matter does not produce much reaction, and the patient makes a fairly rapid recovery. As illustrating the results, in the case above of Ella H., she was operated first on March 25th, and left the Hospital on April 6th. The second operation was on May 28th, and she left well on June 23rd, with almost no irritation after either operation. Anna H. was operated on the same dates as her sister and the recovery was equally satisfactory.

Of especial interest is the case of Clara W., in whom an extraction of the hard nuclear cataract was performed, on account of the luxation of the lens into the anterior chamber, with satisfactory results. The thorough use of atropine I deem of much importance, to be continued until the eyes are absolutely free from all injection. Patients are kept in bed never longer than twenty-four hours, and the eyes are kept covered not longer than four or five days, unless there is some special reason. They are all treated in the open wards, with no darkening of the room or other protection than medium tinted smoked glass.

TENTH INTERNATIONAL CONGRESS OF OPHTHALMOLOGY.

Lucerne, Sept. 18, 1904.

EXHIBITION.

The Committee of the Tenth International Congress of Ophthalmology has charged me with the preparation for the appropriate exhibition of all scientific apparatus, instruments, and the various appliances for instruction, which will be sent to the Congress.

I therefore request all colleagues, as well as all scientific, optical and mechanical firms who wish to exhibit any objects at the International Ophthalmological Congress in Lucerne to apply to me before July 1, 1904, giving an exact statement of the object to be exhibited, of the space demanded, and of the kind and strength of electric force which may be required.

Objects, which are announced later, can only be accepted as far as the space at disposal will still allow.

PROFESSOR DR. A. SIEGRIST, Bern.

Director of the Ophthalmological Clinic of the University, Bern.

MEDICAL SOCIETIES.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

CHARLES HIGGENS, F.R.C.S., Vice-President, in the Chair.

Thursday, January 28th, 1904.

PROPTOSIS.

MR. W. H. H. JESSOP read a paper on this subject describing two cases.

The first one was of syphilitic origin, the patient being a man who suffered from intense headache with swelling in the right temporal region and protrusion of the eyeball. He was treated with iodide, etc., but without much relief. The vision was reduced to fingers at 12 in., there was slight ptosis, pupil 4 mm., inactive, optic disc pale and a discharge from the nostril. An incision was made into the swelling and dead bone was discovered. This gave slight relief but the pain soon returned and Mr. Waring then undertook a very extensive operation and removed a great deal of necrosed bone including a portion of the great wing of the sphenoid.

The patient recovered and was much benefited.

The second case was that of a lady who had normal acuteness of vision when first seen but subsequently developed retrobulbar neuritis and supraorbital neuralgia. The symptoms increased with proptosis and tumor of the optic nerve was diagnosed. Sir Victor Horsley operated and a growth was found which proved to be an endothelioma. The patient was much relieved.

Mr. Jessop referred to other cases and emphasized the great relief afforded by the operations.

ASTHENOPIA.

MR. C. BROOKSBANK-JAMES read a paper detailing a plan of treating some cases of asthenopia. He had noticed how rare it was to see myopia develop in watchmakers and those who used a single eyeglass for magnifying their work; apply-

ing the same principle to other cases he had come to the conclusion that the development of myopia might be arrested by similar means. He mentioned the case of a patient who had — 1.5 D myopia, and for this he ordered a glass of + 1.5 to be used for one eye only, so that convergence might be prevented. The myopia did not increase during many months while using this method, though it increased 0.5 when ordinary glasses were used.

MR. C. WORTH thought that, in cases in which pain and fatigue were prominent symptoms, hyperphoria was present.

MR. BISHOP HARMAN did not consider that the mere closing of one eye would prevent convergence when looking at a near object; and thought it would much interfere with education if this plan were adopted.

RHEUMATOID ARTHRITIS.

MR. BEAUMONT read a paper on the eye symptoms of rheumatoid arthritis, with especial reference to the fields of vision. In spite of recent research by Bannatyne and Wohlmann there was much that was obscure in rheumatoid arthritis, and he desired to call attention to the contraction of the fields of vision which frequently occurred. He compared the compound charts of male and female patients and found them similar. They were obtained by a novel method. The number of degrees from fixation point outwards was noted in each case. These were added together and divided by the number of patients examined, and so an average field was constructed. The uniformity of the fields in males and females excluded, he thought, hysteria but not necessarily neurasthenia. There was no central scotoma in rheumatoid arthritis, and no evidence of optic atrophy, and, as a rule, not more than a proportionate contraction of the color fields. He remarked upon the Raynaud-like symptoms that were sometimes present, and said that Dr. Samuel Lodge had noticed contracted fields in this disease. Possibly the contraction was due to the syncopal conditions of the terminal vessels of the retina. Diagrams were shown in which expansion of the fields occurred when amyl nitrite was inhaled, whereas in a healthy person no enlargement was noticed.

TUBERCULOSIS OF THE CHOROID.

MR. J. R. LUNN described a case of tuberculosis of the choroid. The child was 6 years of age, and was suffering from symptoms of general tuberculosis, and was in a typhoid condition. There was discharge in the left ear. Optic neuritis was present and a swelling in the choroid. In spite of the disease the child got quite well, but the oval area in the choroid was still present, though the optic neuritis had subsided. He thought the case was doubtless tuberculous.

MR. JESSOP mentioned a case of allied character.

The Color Vision Committee handed in its report. The committee were of opinion that Holmgren's test was sufficient for the detection of a large number of color-blind cases; but they agreed with Dr. Edridge-Green that some cases of color-blindness could not be detected by Holmgren's test however skillfully and fully used; and that other cases which satisfied Holmgren's first test (pale green), and would therefore be passed as normal in most ordinary routine examinations, were exposed by the careful use of Holmgren's second test (rose test color). They further agreed that some cases were only to be detected by the use of the lantern. The discovery of the defect could, as a rule, be made with certainty by Dr. Edridge-Green's modification of the wool test. They also drew attention to the importance of the shortening of the red end of the spectrum in some patients and to the necessity of having a test that would detect such cases. Shortening of the violet end was also important when violet or purple lights were used.

SPECIMENS.

The following card specimens were shown: Mr. Johnson Taylor: A swelling of unusual size, probably inflammatory, in the ciliary region.—Mr. Treacher Collins: An unusual superficial circumferential opacity of the cornea, symmetrical in the two eyes.—Mr. G. W. Thompson: An unusual form of central choroiditis in a young man.—Mr. G. W. Roll: Unusual changes in the macular region.—Dr. D. Mowat: Paralysis of inferior recti muscles.—Dr. Rayner Batten: Subretinal hæmorrhages.

JOHN TWEEDY, F.R.C.S., President, in the Chair.

Thursday, February 11th, 1904.

GONORRHOEAL CONJUNCTIVITIS AND HYDROGEN PEROXIDE.

MR. BRONNER read notes of a case in which a woman aged 32 had had her eye inflamed for two days before being seen. The lids were swollen, and a profuse discharge was present in which gonococci were found. Perchloride of mercury was used as a lotion, as well as protargol (5 per cent.) to the lids, and drops of 3 per cent. hydrogen peroxide instilled every four hours. On leaving off the peroxide the cornea rapidly became ulcerated, but on recommencing it the ulcer at once ceased spreading and healed, leaving remarkably little scar behind. Excellent vision was obtained, and Mr. Bronner had never seen so bad a case make so remarkably good a recovery. This he attributed to the peroxide.

The PRESIDENT had used hydrogen peroxide in cases of hypopyon ulcer, but had not tried it for purulent ophthalmia. The ulcer cases did very well indeed.

MR. HARTRIDGE said that years ago all cases of purulent ophthalmia at Moorfields were treated with peroxide, but that for some reason or other it had been given up. He thought protargol of weaker strength than 20 per cent. was of very little use.

MR. HOLMES SPICER said that some years ago he published a large number of cases of purulent ophthalmia treated at Moorfields, and he found that those treated with silver did much better than when treated only with peroxide.

MR. BRONNER, in reply, said that he did not at all advocate its use to the exclusion of silver and other remedies, but in combination with them he was much impressed with its utility.

CONGENITAL ANTERIOR STAPHYLOMA.

MR. J. HERBERT PARSONS read a paper on the case of a girl, aged three days, admitted at Moorfields under the care of Mr. Fisher, with an anterior staphyloma of the left eye.

The condition was noticed at birth. The mother was healthy and the confinement was normal; the child was born immediately after rupture of the membranes; there was no

other deformity. There was a very slight mucous discharge, and a complete anterior staphyloma with no anterior chamber. The iris was adherent to the pseudo-cornea, which was very thin and almost transparent. Pathological examination showed the usual features of an anterior staphyloma, the lens being *in situ*, and the whole eye in an early stage of panophthalmitis. The posterior chamber was full of polymorphonuclear leucocytes, which were also present in the vitreous. The true cornea at the sides showed dense infiltration; the epithelium and Descemet's membrane were present here only. The anterior capsule of the lens was ruptured; the lens was cataractous, but there was no anterior capsular cataract.

Nine previous cases of congenital anterior staphyloma with pathological examinations had been reported. All the cases showed exactly the same features which were found when the condition developed in the usual manner after birth. It was probable that the intrauterine cases were due to the same cause—namely, perforation of the cornea. Traumatic perforation of the cornea under these circumstances was very improbable. Could intrauterine ulceration of the cornea occur? Endogenous infection was improbable, owing to the absence of blood vessels in the fetal cornea; at the same time it might be brought about by toxins. Exogenous infection through the amniotic fluid was more probable, and accounted for the frequency of bilateral disease. There was no doubt that intrauterine transmission of infection—for example, anthrax, tubercle, etc.—could occur. Infection per vaginam at birth could be indefinitely eliminated in some cases—for example, Hirschberg and Birnbacher's and Runte's, in which the children were seen half an hour and half a day respectively, after perfectly natural confinements. It was improbable in the case cited, seen on the third day. It was almost impossible to explain the cases on the theory of mal-development, and even then the inflammatory condition would require explanation.

MR. TREACHER COLLINS, who had seen the specimens, thought failure in the development of the anterior chamber was the original cause of the condition. The inflammatory changes might easily have occurred in the three days following birth; and, as there was a gap in the anterior capsule, he

thought that there had been a perforating lesion caused most probably by the finger of the accoucheur.

MR. NETTLESHIP referred to two cases that he had seen; and MR. PARSONS replied.

CARD SPECIMENS.

Messrs. A. Ogilvy and Sydney Stephenson: Specimens of epithelioma of the ocular conjunctiva.—Mr. Arnold Lawson: Traumatic aniridia.—Mr. Bishop Harman: Nose-blinking movements.—Mr. Hartridge: Unusual opacity of posterior part of the lens and capsule.—Mr. G. W. Thompson: (1) Double kerato-iritis in an infant; (2) peculiar changes of and around the disc.—Mr. Mayou: Two cases of cerebral degeneration in the same family associated with muscular changes.—Mr. Jessop: Epibulbar tumor.—Mr. L. Werner: (1) Lymphoma of the conjunctiva; (2) congenital defect in the ocular movements, combined with peculiar associated movements of the eyes.

ABSTRACTS FROM MEDICAL LITERATURE.

By W. A. SHOEMAKER, M.D.
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SIXTY-EIGHT REASONS WHY "GLASSES DID NOT GIVE RELIEF."

George M. Gould (*American Medicine*, July 4, 1903) says; Headache, sick headache, biliousness, dyspepsia, neurasthenia, anæmia, anorexia, chorea, epilepsy, and many other nervous, mental, cerebral, and denutritional disorders may, or may not, be due to eyestrain. That glasses in certain cases fail to relieve these symptoms is no proof or disproof of either alternative. The failure may be due to any one or to any combined number of the following facts:

1. The patient's complaint may not be caused by eyestrain.
2. Intercurrent disease, dyscrasia, bad hygienic habits, conditions of mind—many indirectly related factors may con-

dition or hinder the cure of the disease which fundamentally depends upon eyestrain, or was principally caused by it.

3. Stopping the cause does not always stop a morbid effect.

4. The glasses may have been prescribed by an optician, instead of by a physician.

5. The physician-oculist may lack the degree of special education and experience requisite to do refraction work.

6. The oculist may not be morally right minded in carrying on his work and in the conception of his function in life.

7. He may not be intellectually fitted or capable of doing this particular kind of work.

8. He may not be sufficiently painstaking in attention to mathematic accuracy and to the slightest details.

9. He has not devoted himself almost exclusively to refraction.

10. He relies upon rules instead of studying each case individually, judging and ordering by intellectual and discriminating methods.

11. He has not office tact and an ability to get in touch quickly with the patient's condition of mind.

12. He has some prized fad or method, as retinoscopy, a peculiar drug, a mechanical device, optometers, refracting machines, etc., in the use of which facts must accommodate themselves to the fancy instead of the data fashioning the diagnosis.

13. He relies upon objective instead of, when possible, upon subjective methods of diagnosing ametropia.

14. He does not use a cycloplegic.

15. His cycloplegic may not be of the right kind.

16. The cycloplegic may not be of good quality.

17. The cycloplegic must be rightly instilled.

18. The office lights, reflections, etc., often prevent accurate answers of the patient.

19. The illumination of the test cards may be so excessive, so poor, or so irregular as to fatigue the patient's retina.

20. Test cards made with black letters on white cards exhaust retinal sensibility in the iris-paralyzed patient.

21. A test card may be hung at such an angle as to re-

flect an irritating and exhausting sheen into the patient's eyes.

22. Astigmatic test cards, Pray's letters, and a hundred devices confuse the patient rather than help him to clearness of decision.

23. It is impossible for the most expert refractionist to elicit accurate diagnostic answers when using the ordinary trial-frame.

24. The case of test-lenses in common use is hardly less ridiculous than the trial-frame, etc.

25. Frequently the test lenses are so scratched or soiled that acuteness of vision is prevented instead of encouraged.

26 to 29. In interposing the low-grade trial lenses to test slight differences of visual acuteness, the detection of the difference by the patient is rendered doubtful or impossible by the usual method of inserting or holding the test-lens.

a. By allowing the interposition of a needless and confusing image.

b. By striking the trial-frame or inserted lens with the differentiating lens, making a noise, and consequently distracting the attention.

c. By getting the hand in the line of vision.

d. By allowing too great time to elapse between two changes so that the memory cannot form and carry precise distinctions, and by not allowing sufficient time in special cases and in certain persons for the formation of such judgments. Great helps in all of these points are two each plus and minus sphericals and cylinders, 0.25 D. each with handles about four inches long.

30. Patients must not be hurried, or intimidated, or dominated.

31. The patient's answers may sometimes be unintentionally the reverse of correct, or wrong in odd and unexpected ways.

32. Good or bad visual acuteness is not the decisive criterion of accuracy of diagnosis of ametropia.

33. There is probably not an optically or "mathematically" perfect pair of eyes in the world.

34. Great care is necessary to determine the relative amounts of astigmatism and of axial defects.

35. The location of the precise axes of astigmatism is necessary for the relief of symptoms.

36. The head of the patient should be kept erect and in a natural position, not canted to one side or downward, while the tests are being made.

37. Low degree myopic astigmatisms are too frequently not diagnosed, and owing to the utter inability of the ciliary mechanism to neutralize them, they may produce severe reflex disturbances.

38. "Full correction" of myopia is a prolific source of eyestrain.

39. The static mydriatic refraction cannot be trusted to dictate the prescription of "constant" glasses.

40. Hypertrophy, or miscalled "spasm" of the ciliary muscle, may make it impossible to prescribe the permanently right glasses at once: may demand changes at short intervals, and may render the glasses prescribed unendurable.

41. The patient's history as to the eyes and reflex diseases must be considered in giving high or low corrections either myopic or hyperopic.

42. The injury to the retina and to the sight-making centers by long eyestrain may make ocular labor impossible for a short or a long time, even with proper correcting glasses.

43. An error may be made in transcribing or copying the prescription; the optician may grind the glasses wrong; his tools may be worn; he may give the patient somebody else's glasses; the patient may exchange spectacles with some one, etc. Loosened lenses may be reinserted wrongly by a jeweler, etc.

44. The order for glasses must be carefully adapted to the occupation of the patient.

45 to 51. The muscle-balance conditions the strength of the lenses to be ordered, the aim being to establish a normal relation between convergence and accommodation.

a. There should be at least thrice the power of adduction as of abduction to give ease in ocular labor of those doing much near work.

b. Low hyperopic corrections are needed in exophoria.

c. High hyperopic corrections are needed in esophoria.

- d.* Hyperphoria of more than 1° or 2° , when permanent, should be partially corrected by prisms ground in the ametropic lenses.
- e.* Permanent prisms correcting exophoria or esophoria are not advisable. In exophoria the adduction power may be trebled or quadrupled by prism gymnastics.
- f.* The wearing of a new correction itself soon changes the muscle tensions, intraocular pressures, etc., and thus may change the ametropia, and make a change of glasses necessary.
- g.* It will surely change the muscle imbalances, thus rendering the old prescription incorrect.

52. and 53. The symptoms of long-continued exophoria and esophoria, of a high degree, may rarely not be relieved by proper ametropic spectacles alone.

- a.* In exophoria that causes symptoms and that does not in time disappear with proper glasses, the symptoms can be relieved only by increasing the adduction power by appropriate prism-gymnastics. It may be doubled, quadrupled, etc., until the symptoms vanish.
- b.* In high esophoria, a very rare condition, producing symptoms, a case or two may be met in a life time, in which there is little or only partial relief, either by glasses, prisms, or surgical operation. Even good oculists cannot cure in more than 999 cases out of 1,000!

54. Like every other biologic condition, the ametropia is constantly changing, and thus retesting is required at stated intervals, with a change of glasses if required.

55 to 60. One of the most frequent causes of eye-strain is ill-adjusted glasses.

- a.* But few people can keep eye-glasses so accurately adjusted, for near work, that they do not produce at least as much eyestrain as they relieve. A new bearing on the nose is unconsciously found which is more comfortable as regards the skin, but which puts the astigmatic axis in an abnormal position. Spectacles are the proper instruments for the great majority of patients.

- b.* Nine-tenths of all glasses are set too vertical. Nine-tenths of all our looking is downward. The axes of vision should be nearly perpendicular to the plane of the lenses in the most straining work.
- c.* Nine-tenths of all glasses are set too high. In downward-looking and in near work, the axis of vision is through the lower edge of the lenses instead of through or near the optical centers.
- d.* Few opticians know how to fit and adjust a pair of glasses so that the pupils are behind the optical centers of the lenses. The photographs of a hundred people wearing glasses show that the glasses are so ill-adjusted as to disgust an observant oculist.
- e.* Few opticians fit the temple pieces of spectacles and adjust the wires to the irregular curves behind the ears, so that they produce comfort. Many patients leave off glasses because of this discomfort to the nose or ears.
- f.* The optician must readjust the lenses at least once a month.

61. Before wearing the glasses ordered they should be seen by the oculist, tested as to correctness of manufacture, and as to the adjustment, etc.

62. Nine-tenths of all glasses are set too far from the eye.

63 and 64. Soiled lenses are frequent and constant sources of eyestrain.

a. From too long lashes.

b. From lack of frequent and proper cleansing.

65. The Canada balsam in bifocal lenses may produce irregularities in the refraction, or it may dry and produce opalescent bubbles so that the eyes soon tire. A lens may have an original or acquired imperfection, flaw, dent, etc., in the axis of vision, producing unendurable irritation.

66. Eyestrain often exists in presbyopes because of the need of bifocal lenses.

67. Pride and prejudice often make people secretly or openly, temporarily or constantly, forego the use of spectacles, of bifocals, and even of eye-glasses.

68. There are one or two ways in which proper glasses

may rarely increase eyestrain, at least temporarily, instead of relieving it. This is when one eye has been thrown out of function by past eyestrain, the image psychically ignored, or the retinal or central organs so weakened, that the proper image so stimulates and arouses function in a weakened organ as to beget trouble until amblyopia disappears and the injured organs become normal in action.

A SIMPLE DEVICE FOR THE TREATMENT OF SPASMODIC
ENTROPION.

Leslie Buchanan (*Ophthalmoscope*, Dec. 1903), after several years experience recommends the following procedure :

“A needle, half curved, about 3 cm. in length, bearing a suture of silk, double, and about eight inches in length, is inserted under the skin of the lower eyelid, at a point about 5 mm. from the ciliary margin, and at the junction of the external and middle third of the lid.

“It is carried along under the skin parallel to the lid margin, and brought out at the junction of the middle and inner thirds. From this point of counter-puncture the suture is drawn out for half its length. The needle is then re-inserted at a point 3 or 4 mm. below the counter-puncture, carried along under the skin again to a point 3 or 4 mm. below the first puncture, and the thread drawn tight.

“The two ends of the thread are then, being 3 mm. apart, crossed, drawn quite tight, tied and cut off short.”

The stitches are removed after a week or ten days. The bridge of fibro-plastic tissue that is formed gradually absorbs, leaving no deformity.

The advantages of this method over the excision of a piece of skin are: It requires no anesthetic, and occupies much less time.

SKIN GRAFTING FOR THE RESTORATION OF THE EYELIDS.

Oscar Dodd (*Jour. A.M.A.*, Oct. 17th, 1903), reports his successes and failures in this class of cases and gives his views of the different methods of skin grafting. The *pedicle graft* has a place which the Wolfe or the Thiersch grafts cannot fill. (1) When placed in a region devoid of bloodvessels it still has a source of nourishment. (2) It has a firmness and substance which is necessary on the lower lids especially when the whole thickness of the lid has been removed with a

tumor. (3) Shrinkage is at a minimum. $\frac{1}{4}$ to $\frac{1}{2}$ the original size, and (4) It is nearly like the skin it is intended to replace. On account of its thickness and weight, the author does not advise the use of this graft for the upper lid.

The greatest objection to the *Wolfe graft* is its uncertainty. For the lower lid it is preferred to the *Thiersch graft*, in some cases, as it gives more support. On account of its weight, it should not be used on the upper lid, except in special cases.

The *Thiersch graft* is probably the easiest to handle and seems to grow wherever a raw surface is prepared for it.

By some it is used to the exclusion of all others, but the author feels it has its limitations.

In preparing this form of graft the author has the skin perfectly dry and uses a dry razor, in preference to using the salt solution, as he can cut much better grafts and has less trouble getting them into place. The amount of shrinkage that takes place depends entirely upon the tissue upon which they are placed. If placed on a surface that does not contract no shrinkage takes place: if it does contract, shrinkage occurs.

Summary: For the upper lid *Thiersch grafts* should always be used, unless the whole thickness of the lid is destroyed.

In forming the lower lid, if there is adjacent skin available it should be used to form the lid and the resulting defect filled in with *Thiersch grafts*. When there is dense cicatricial tissue for the floor of the graft a pedicle graft is the only one which I have found satisfactory.

Should pedicle grafts not be available and the underlying tissue have proper vascularity, then either *Wolfe* or *Thiersch grafts* may be used, and my results have been best with a *Wolfe graft* prepared very thin.

PRIMARY MELANO-SARCOMA OF THE EYELID.

A. V. Lotine (*Roussky Vetch*, July 12th, 1903) reports a case in a man aged twenty-six years.

"The growth arose with a broad base from the edge of the lower right eyelid, and included almost the entire surface of the latter, partly closing the eye and partly hanging over the cheek. It was spherical, dense, moist, bleeding on the removal of crusts, and was dark-brown, in places black. Its

size was that of a small apple. The eyelid was everted and œdematous, and the veins around the parts were dilated. The left submaxillary and parotid glands formed dense swellings of the size of a child's head, and there was a large ulcer at the lower part of this swelling. On microscopical examination, the growth was found to be a melano-sarcoma. Such cases are rare, but not so rare as they are stated to be in text books. Thus, Kastalskaya collected fifty cases from literature up to 1899, and since then the present author has been able to find ten additional instances, making in all sixty cases of primary melano-sarcoma. (*N. Y. Med. Jour.*)

TUMORS OF THE CONJUNCTIVA.

Edward Adams Shumway (*Jour. A. M. A.*, Sept. 26, 1903) discusses primary tumors of the conjunctiva, dividing them into two classes: (1) malignant, (2) non-malignant. Malignant growths (carcinoma and sarcoma) usually appear in patients over forty years of age. Their point of predilection is at the corneo-scleral margin, and a microscopical examination is frequently necessary to make a differential diagnosis.

Carcinomatous growths consist of proliferating masses of epithelial cells, which develop from the surface epithelium and are separated into alveoli by a connective tissue stroma; they appear first as small, pale reddish masses, usually of slow growth, with little tendency to penetrate the cornea or sclera. If allowed to remain, however, they will ultimately perforate the eyeball.

A number of cases of melano-carcinoma have been reported. Panas believes melano-carcinoma to be the rule and melano-sarcoma the exception.

Sarcoma develops chiefly from the pigmented nevi on the conjunctiva; it is a soft vascular growth, usually more prominent than the carcinomas and occasionally possesses a pedicle. It consists of closely packed spindle-shaped cells, running in definite bundles, or, more frequently, the cells are arranged in distinct alveoli, separated by a connective tissue stroma. In many cases the cells are flat and are epithelioid or endothelial in type. The growths are to be distinguished from carcinomas by the absence of involvement of the surface epithelium. Recurrence after removal frequently occurs.

Benign growths of the conjunctiva are divided into (1) congenital (2) acquired. The former being sessile and the latter usually polypoid in shape.

Dermoid tumors are by far the most frequent of the congenital growths, usually situated at the corneo-scleral junction on the temporal side, and are frequently associated with other congenital anomalies, such as coloboma of the lid—a temporary attachment of the amnion to the eyeball during fetal life, is given as the cause by most of the late writers.

Lipoma is a more rare congenital growth, appearing as a yellowish mass between the insertions of the external and superior recti.

Osteoma is a rare subconjunctival tumor, (twelve cases have been reported) representing small pieces of true osseous tissue, and are supposed to be the result of a temporary adhesion of the amnion to the eyeball.

Lymphangiomas and *telangiectasias* are very rare congenital growths.

The acquired forms of benign growth are:

(1) *Fibroma*, soft and hard. The soft occurs mostly in the fornix or in the palpebral conjunctiva. The hard variety is less frequent and is found chiefly in the palpebral conjunctiva and the caruncle.

(2) *Granuloma* is the result of a superficial loss of conjunctival tissue, frequently after tenotomies, enucleations and after rupture of chalazia.

(3) *Papillomas* are among the most common tumors of the conjunctiva. They are small growths whose surface is covered with tiny papillae, like the surface of a raspberry, instead of being smooth as is the surface of a fibroma. They occur mostly in the neighborhood of the caruncle and semilunar fold; but are also found on the tarsal and bulbar conjunctiva. Unless thoroughly removed they show a tendency to recur.

(4) *Adenomas* rarely occur, (five cases have been reported) and are found mostly in the neighborhood of the caruncle, as pale red, isolated tumors.

(5) *Hemangiomas*, of which fifty-two cases have been collected by Pergens, may be congenital or develop later in life, and are found on the palpebral and bulbar conjunctiva, the fornix and plica semilunaris, as round, polypoid and oc-

asionally sausage shaped growths, whose surface is sometimes smoothe and sometimes nodular.

(6) *Cysts* of the conjunctiva are comparatively rare, and are found chiefly on the fornix, bulbar and palpebral conjunctiva, in the form of transparent vesulis filled with a serous fluid, and may be the result of "invaginated processes of epithelial cells," pterygia, enlarged lymph vessels, and closure of the excretory ducts of the accessory lacrimal glands, and the glands of Henle. Cysts from the glands of Henle are quite frequent in chronic catarrh and trachoma.

PATHOLOGY OF THE CERVICAL SYMPATHETIC.

John E. Weeks (*Jour. A. M. A.* Jan. 30.) concludes his paper as follows:

The testimony in our possession is not sufficiently conclusive to enable us to say that there is any constant change in the cervical sympathetic peculiar to glaucoma. Nor is it sufficiently conclusive to exclude the possibility of such constant change. Farther and more careful research is necessary; first, probably along the lines suggested by Dr. Van Giesen, viz., by means of the Ehrlich methylene blue method with fresh ganglia or by other equally delicate methods for the purpose of determining the conditions of the processes of the neurons and the cell structure, and, second, a study of the pigmentation of the neurons, which must be made in comparison with control studies.

THE INFLUENCE OF RESECTION OF THE CERVICAL SYMPATHETIC GANGLIA IN GLAUCOMA.

William H. Wilder (*Jour. A. M. A.*, Feb. 6th and 13th) presents a detailed report of seven cases in his own practice, and gives an abstract of the records of sixty-one cases as furnished him by different observers in answer to a circular letter sent out last spring.

The author concludes his paper as follows:

I feel that positive conclusions are not yet to be reached, and will not be until more carefully selected cases can be studied for longer periods of time.

The operation in itself, while a major one, is not to be considered one of unusual danger, and with modern technic should show a very trifling mortality. The death recorded in

our present series was purely accidental, and might have occurred in any other operation on the neck. With such brilliant results before us as are presented in certain cases on record, we must agree that sympathectomy is not an operation to be condemned too hastily. It certainly is not fair to condemn it when it fails to restore sight to an eye that has suffered so long from glaucoma that it is blind from atrophy of the nerve, or when it fails to check pain in an eye that is hopelessly lost from absolute glaucoma.

If it is to be compared with iridectomy at all, it should be given an early trial in any form of the disease in which it is applicable.

The statistics up to date seem to indicate that the simple chronic form is the one most suited for it, next to the hæmorrhagic form, if that can be determined. As a guide for my own practice, I should feel very much like following Abadie when he says: "In acute forms of glaucoma and in subacute with intermissions, practice first iridectomy, and if it fails do sympathectomy. In simple glaucoma use myotics twice a day; if they suffice, continue them. If, in spite of their systematic employment the vision fails, do sympathectomy.

INFLUENCE OF RESECTION OF THE CERVICAL SYMPATHETIC
IN OPTIC-NERVE ATROPHY, HYDROPHTHALMOS
AND EXOPHTHALMIC GOITER.

J. M. Ball, (*Jour. A. M. A.*, Jan. 30) from his experience and a review of the literature of the subject, draws the following conclusions:

1. Excision of the superior cervical ganglion of the sympathetic nerve is worthy of a trial in those cases of simple atrophy of the optic nerve which resist measures less heroic.
2. It is yet impossible to say whether the bilateral operation is advisable in unilateral optic-nerve atrophy.
3. The value of sympathectomy in congenital hydrophthalmos has not been demonstrated.
4. In exophthalmic goiter, complete excision of the cervical sympathetic is followed by a larger percentage of cures than in any other procedure. Thus far no deaths have been recorded. The number of operations, however, is small and final conclusions can be announced only after a large number of cases shall have been treated by this method.

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ORIGINAL ARTICLES.

DENDRITIC KERATITIS.

By J. W. CHARLES, M.D.
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THE clinical picture of dendritic, or "malarial," keratitis may best be exhibited by the following extracts from those authors who have first called our attention to this form of corneal disease:

KIPP (*Trans. Am. Ophth.*, 1880, p. 91) says: "Dendritic keratitis commonly developed within a few days after an attack of intermittent fever, often simultaneously with the appearance of herpetic vesicles on the nose or lips. In some cases every fresh attack of the fever was followed by this corneal affection." Usually only one eye is affected. "Shortly after the first symptoms of irritation, one, or two or more, slightly raised, irregular, opaque lines of varying length will be found on different parts of the cornea. At the same time some circum-corneal injection will be present. On the following day these opaque lines have increased somewhat in length, whilst at the same time the middle portion of the opacity has been transformed into a shallow ulcer. Under favorable circumstances, no further increase in size takes place, the remaining opaque epithelium is thrown off and reparation begins to be completed only after several weeks. But not infrequently the ulcer continues for days and even weeks to grow slowly in length, and at the same time sends out club-shaped,

slightly raised, grayish offshoots from its sides. In some of my cases the ulcer crept across the entire cornea, and in a few others in which several ulcers appeared simultaneously on different parts of the cornea, nearly the whole epithelial layer was eventually destroyed. The middle and inner layers of the cornea generally remain transparent throughout, but in neglected or maltreated cases an extensive star-shaped opacity of a slightly yellowish-gray tint is sometimes developed in the inner layers of the central part of the cornea. A hypopyon is but rarely seen even in the severest cases, and spontaneous perforation of the cornea did not occur in any of my cases." He mentions hyperæmia of the iris. No change in T. nor in corneal sensibility detected. Severe pain in and around eye. Photophobia and lacrymation. Process of repair extremely slow—two to four months, and it differs from Horner's corneal affection occurring with herpes nasalis in diseases of the respiratory organs "in that, instead of transparent vesicles, small, opaque elevations not unlike phlyct-ænulæ, arranged in lines, are developed in the initial stages of the disease." In Horner's cases there is no tendency to spread.

MINOR (*Am. Jour. of Med. Science*, 1881) on anæsthesia of cornea (10 cases) which is not due to pressure (œdema) or to "neuroparalysis," so-called, maintained that the sensitive vasomotor, or trophic filaments from the Gasserian ganglion, or the entire branch of the fifth nerve may be attacked. Anæsthesia was always in the cornea—in five cases in the conjunctiva. In six cases keratitis was combined with anæsthesia. Vasomotor disturbance is shown by paralysis of the vessels in the conjunctiva and iris. Dilatation of the iris vessels was sufficient to maintain an obstinate contraction of the pupil without adhesions or exudations, in spite of use of atropia. T. minus—in three cases. In five cases a history of malaria with supraorbital neuralgia. Some of these cases were plainly herpetic; in one, old herpetic scars.

EMMERT, E. (*Centrb. für Prakt. Augenheilk.*, Okt., S. 302, 1885). "Keratitis dendritica exulcerosa mycotica. Sudden violent photophobia, lacrimation and conjunctival injection, gray sub-epithelial clouding, beginning as a minute focus from which branches shoot out, or as a fine groove

which elongates, divides and sends out lateral sprouts. Through casting off the epithelium, furrow-like defects are left. Bacilli in the grooves. The disease begins spontaneously, without known cause, in May, April, August and September, i. e., in later winter or spring or fall, usually suddenly; in two or three days there is violent photophobia, lacrimation, conjunctival swelling. At the same time is seen a marginal gray subepithelial clouding, which begins as a small focus, from which branches shoot out, or as a fine streak (striation) which elongates, divides and also sends out lateral buds. Very soon the epithelium over the cloudy portions begins to be elevated and cast off, causing furrow-like grooves. The chief and secondary branches always remain fine. On account of the depth of the furrows and the intensity of the cloudiness which remains a long time, it must be conceded that the process is not only subepithelial but also attacks the anterior limiting membrane and the most superficial layers of the substantia propria." Healing always began from the part first affected. None of the usual remedies seemed to hasten the recovery. His first three cases began with an ulcer in the margin. In his case No. 3, "these branches and buds appeared as ash-gray, subepithelial, but also more deeply attacking, infiltrations which as long as they were not deprived of their epithelium, were constantly grayest in their axis, fainter toward their edges." He found bacilli in the grooves. His cases seemed by preference to attack those of tubercular diathesis. Hansen Grut saw no reason to accept this theory.

HOTZ, F. C., (*Chicago Med. Jour. and Exam.*, Dec., 1891) says: "Let me assist his imagination by the aid of some familiar object in nature. Draw within the compass of the cornea the outlines of a small lanceolate leaf, with its stem at the margin and its free end in the center of the cornea: have the central vein of this leaf run in a slightly zigzag course and let the lateral veins be short. Now erase the outlines of the leaf and the skeleton of the veins is a correct representation of the specific character of a malarial ulcer of the cornea. This form of the ulcer is as pathognomonic for malaria as the mucous patches in the mouth are for syphilis. Local treatment alone is insufficient. Give your patient

quinine and you will arrest the ulceration at any stage of its progress and speedily relieve. The amelioration supervenes upon the administration of quinine (two grains every two hours), so promptly that it must be attributed to the influence of this medicine. And when the surgeon has faithfully but vainly tried for a week or two to subdue the trouble by appropriate local treatment, the sudden change following directly upon the use of quinine is so suggestive and striking as to convince even the most skeptical Thomas."

ELLETT, E. C., (*Ophthalm. Rec.*, 1899) did not find dendritic keratitis with the grippe, and refers to the fact that Godo, in 1880, found malaria positively in one-third of the cases. The eruption is papular instead of vesicular. He has not seen it under the age of sixteen; it occurs in males and females, whites and blacks. The history of malaria is usually intermittent; often following the first chill or any subsequent one, the eye becomes inflamed. Examination: "A minute whitish hair line, or rarely a point, on the cornea, a subepithelial exudate consisting of a row of points, pain, photophobia, bulbar injection. Kipp's supraorbital tenderness is not marked, and is often wanting in my cases. * * Numerous white points so small that two or three may often be accommodated in the hair line's width. * * * In two or three days the epithelium ruptures over the infiltration and at the end of this time branches generally begin to form either by sprouting off from the main line or by little points forming and extending to the original branch." Appearance: "A broadening, shallow trough usually branched," base gray, cornea otherwise not disturbed nor vascular. Healing very slow. Never deep, rarely causes hypopyon, or iritis, never perforates, always leaves an opacity behind. He quotes:

HANSEN-GRUT (*Eighth International Med. Cong.*, 1884). "Superficial ulceration with a chronic course and a tendency to become serpiginous; propagation by means of buds or excrescences so that the line of demarkation of the very superficial ulcer becomes very irregular; the surrounding parts are clear and the cornea is not vascular. In no way connected with frontal herpes and not vesicular."

NOYES, H. D. (*Textbook*): "1—Lesion confined to anterior and superficial layers; ulceration (rarely much infiltra-

tion) which may become suppurative. 2—Blunted sensibility of cornea; only slight photophobia. 3—Tenderness of supraorbital nerve at its notch and pain in its radiations. 4—History of chronic malaria. Its character is mycotic and may occur without malaria; cured by local means. True malarial keratitis is not cured without quinine or arsenic.”

WILDER, WM. H., (*Jour. Am. Med. Ass’n.*, Oct. 21st, 1893) reviewed the literature and pertinently asked whether all of these forms were not really different manifestations of the same disease, viz.: herpes febrilis corneæ. He believes that “the contention of the latter authors (Kipp, Hansen-Grut and Emmert) that in cases of dendritic ulceration there is no question of vesicles, does not seem to be well grounded, since most cases would probably present themselves to the surgeon only after the delicate epithelium covering the vesicles had broken down when only the minute ulcer would be seen.”

Here in the Mississippi Valley we have the opportunity of seeing dendritic keratitis in all stages, both the vesicular, herpetic form and also the papular. In the clinic of the O’Fallon Dispensary, I have seen herpes, with or without facial herpes, sometimes breaking down, more often not breaking down, to form an ulcer; and in addition the distinctly infiltrative papular form, also branching, which generally becomes ulcerative. The first we designate as “herpes,” the latter as “malarial keratitis.”

Some authors have implied that children are never attacked. I remember one child of six years who had a typical lesion, yet the general medical clinic could find no plasmodia. However, after several weeks the patient had a distinct chill followed by fever and recovered under anti-malarial treatment.

The question presents itself, What is the nature of the lesion, and the *modus operandi* of its cause?

That “malarial keratitis” may be caused by other diseases than malaria is well illustrated by the following case:

April 26, 1902, at a time when several general practitioners said that this region was absolutely devoid of malaria, came F. C., 38 years old. Six days before he had had a chill with fever following it. He had been treated by Dr. Tiedemann of

this city for grippe, the diagnosis of malaria having been excluded by the absence of recurrence. From the beginning his left eye was red and uncomfortable when he attempted to read. The patient had slight catarrhal conjunctivitis R. and L. The left eye exhibits a very superficial keratitis resembling by daylight a corneal abrasion without infiltration, but by focal illumination it was seen to be accompanied by an irregular, faintly outlined haziness sufficiently beaded to lead

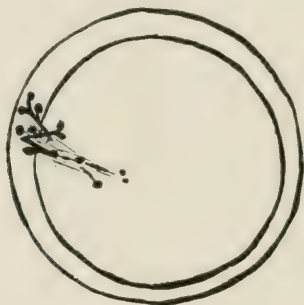


FIG. 1.
Taken April 29th.



FIG. 2.
Taken May 1st and re-
mains apparently
unchanged
until

me to suspect malaria. It showed no trace of the marked, dirty infiltration of a virulent infection. Used argent. nitrat. R. and L., atropia with cocain in castor oil O. S. and bandage. I gave him a note to Dr. Tiedemann, who repeated that the case was one of grippe.

On the following day a 2 per cent. fluorescein solution gave lesion shaped like Figure 1.

May 1st—Lesion was more clearly defined and seemed cleaner. \mathcal{R} quin. sulph. gr. iij, ferri red. gr. j, strych. sulph.

gr.¹/₃₀—t. i. d. R Hydrarg. chlor. mit. gr.¹/₄—t. i. d. Used ag.¹/₄₈₀ to the everted lids; adrenalin, bisulph. of quin. (dropped) coc. et adren., A. and C. with oil and bandaged. The cornea was very anæsthetic before any drops were used. The patient is anæmic and very nervous.



FIG. 3.
May 8th.



FIG. 4.
May 15th.



FIG. 5.
Appearance at the time
of the last visit.

May 2nd—Patient had severe pain over the left eyebrow at about noon yesterday. No manifest change in the corneal lesion.

May 3rd—Severe left supraorbital pain with slight nausea. No appetite.

May 8th—Continuity of lesion begins to be interrupted;

appearance as in Figure 3. There is now visible a small, faint central haziness in the anterior portion of the substantia propria and a superficial tri-beaded infiltration in the outer lower quadrant.

May 15th—(Vid. Figure 4). No trace of original branching arrangement. Scar tissue rapidly becoming white and firm, surface still uneven (uncovered by epithelium). The central infiltration, while in the substantia propria, is quite superficial, is circular, or more accurately, roughly stellar and much less opaque in the center than in the periphery. The patient denies any opportunity of ever having contracted lues.

May 20th—Upon leaving the city for five weeks, I turned the case over to Dr. A. E. Ewing. Corneal scar still rough, but irritation has almost disappeared. Dr. Ewing treated the patient with sol. argent. nitrat. gr. j ʒj to everted lids, applying quin. bisulph. gr. xv to ʒj and ung. Hy. O. Fl. gr. iv to ʒi.

June 4th—Gave permission to remove bandage in the house.

June 15th—Still improving.

June 28th—The patient is sent back to me. Phlyctenular infiltration in upper inner border of the original scar. The patient is still very anæmic.

July 1st—Yesterday the eye felt sore. The cornea was roughened from above and in, toward the center. To-day bloodvessels begin to enter from above. The central haziness is denser. Ag. $\frac{1}{480}$, natr. biborat. sat. sol., atropiæ alk. et cocain alk. cum ol. ric., bandage.

July 2nd—Phlyctenule about well. Resumed capsules of quin. iron and strychn., also calomel t. i. d.

July 15th—Doing well.

July 26th—Patient goes north. Two fine parallel bloodvessels enter the cornea above, but the scar is smooth and the cornea otherwise clear. Vision with glass $\frac{15}{38}$.

August 18th—The patient returns well. V. $\frac{15}{38}$.

Dr. Tiedemann's notes:

April 28th. Dear Doctor: In reply to yours of Saturday, would say that Mr. C. had a slight fever and sore throat, which I diagnosticated as grippe. I gave him 5 gr.

doses of aspirin, several days later increasing the dose to 10 grs. every 4 hours, as he then complained of pains in his shoulder muscles. I made no blood examination, but will be glad to do so if you wish it."

"April 30th. I have looked diligently for malarial plasmodia in Mr. C.'s blood, but did not find any. I examined both fresh and stained specimens. The red and white cells are normal in number and relative proportion."

Six days after a malarial "chill and fever" treated with aspirin, we should expect to find plasmodia as well as recurrence.

NOYES (*Textbook*, p. 358) says: "That it (dendritic keratitis) is pathognomonic of malaria seems to me improbable, because I have seen many cases of malarial keratitis without it, and have seen one extremely typical case in which the cause certainly was not malaria but exposure to a fearful snow storm. An Irishman * * * * was brought suffering with so-called snow-blindness. I found the above streaks running through both his corneæ. This case was purely local. But true malarial keratitis, while it may have the nodular branching streaks, will not be cured without quinine or arsenic." If dendritic keratitis is assumed to be a peripheral neuritis, this case may be easily explained.

The inference that this disease is due to a terminal nerve lesion, is warranted, I believe, by the following facts:

First: Dendritic keratitis has been observed most frequently in those diseases which are especially prone to attack the nervous system—central and peripheral.

That form caused by herpes is vesicular in the beginning and is the expression of a descending neuritis caused by a lesion in the Gasserian ganglion, due to the poison of those acute fevers which, when they affect the nervous system, are more prone to attack it centrally than peripherally.

The second form, that caused by malaria, grippe, etc. (diseases which are more apt to attack the peripheral rather than the central nervous system, causing muscle paralysis, etc.) is not vesicular, but papular, in the beginning; but because it, also, is branching and follows the same irregular course as herpes, one may with reason infer that it, also, is a nerve lesion, probably purely peripheral. The extreme persistence

of the attack in those cases which do not recover immediately, points in this direction. "Nervous manifestations are usually divided into intermittent and persistent." "The pure intermittence of nervous symptoms is essentially rarer than their persistence, although, as most usual, they last only a few days." (Mannaberg on Malaria, *Nothnagel's Encyclopedia*).

Second: The lesion is possibly the result of a degeneration, perhaps inflammation, of (or along) terminal filaments of the corneal nerves. It is not necessary to assume an inflammation as the cause of the original dendritic form of opacity. The cornea becomes cloudy after death, in atrophy or from oedema. Its tissue is a connective tissue, so modified as to be transparent (during life), and its nerves are either so small as not to be noticed (if they are opaque) at their position in the refracting system, or they are also so modified as to be transparent (loss of medullary sheath). The cause of dendritic opacity may lie in a process which simply (1st) renders the subepithelial plexus opaque, at the same time giving rise to (2nd) an inflammation of the more resisting surrounding tissues with consequent breaking down into a very superficial ulcer. (The epithelium loses its support either by injury to it or by a change in Bowman's membrane). If we assume this to be the case, the foci of inflammation (i. e. the bead-like infiltrations) are probably located at the triangular branching nodes. The fine lines seen between the foci are probably either the opaque degenerated terminal bundles of the subepithelial plexus, or they are composed of leucocytes traveling along the paths of these bundles, eventually causing slight injury to them in those mild cases which recover quickly, or atrophy in those very obstinate cases which extend over months before healing even begins.

The former proposition is plausible, if we remember that nerve fibres lose their medullary sheaths where transparency is needed, as in the cornea and retina, or when more room is required, as in the crowding which takes place in the brain; and that, however, as soon as a non-medullated fibre degenerates, it becomes opaque and a bundle of such fibres might then become readily visible to the unaided eye.

Evidences of the origin of dendritic keratitis in a lesion of nerve terminals or fibrils are—

First: Anæsthesia, which I have rarely found wanting in these cases. This symptom originates from one of three causes—hysteria, “neuro-paralysis” and pressure œdema as seen in glaucoma. After considering the slight infiltration, as compared with that accompanying so many other corneal lesions which do not exhibit this symptom, one must regard the power of resistance of the nerve terminals to injury by pressure in these cases, as greatly diminished, to say the least, and therefore that the poison has acted directly on the terminal fibril.

Second: The shape of the lesion itself in the beginning resembles much the arrangement of the fibres in the subepithelial plexus. Then, too, the branching in our cases and in most of those published seemed to follow the directions of the nerves from the periphery either diagonally or toward the center rather than from the center toward the periphery. I do not mean that the disease does not often begin at the center, but that, what branching does occur, follows as if the base were a peripheral stem.

Emmert's cases:

1st Case—Ulcerative keratitis, at the temporal side 3 mm. in extent, from which a fine epithelial streak advances toward the center of the cornea; buds, right and left, followed, originating a furrow ulcerative keratitis.

2nd Case—A superficial infiltration with loss of epithelium at the upper corneal margin, contiguous to which began an irregular, branching, finely streaked gray infiltration, subepithelial, but also, in the anterior elastic lamina and the superficial corneal layers, extending toward the pupil.

3rd Case—A superficial ulceration at the inner upper corneal margin. Buds with furrows. Two large branches.

4th Case—Keratitis dendritica 1 mm. distant from the temporal corneal margin, with an entirely (distinct) separate branching lesion in the neighborhood of the pupil.

5th Case—A 3 mm. infiltration in lower outer portion not at edge.

6th Case—A small branching infiltration below and inward separated from the margin. Rather deep furrows.

Hotz's cases:

1st Case—Near the upper margin a small, linear abrasion with a peculiar zigzag branching line advancing toward the center.

2nd Case—A small abrasion at the upper margin, in a week extending almost across the cornea.

3rd Case—In the upper nasal section near the margin a minute "phlyctenule-like spot" from which a fine, gray linear opacity proceeded downward 1 mm., branching below.

Ellett's cases:

1st Case—A crescentic, narrow ulcer near the inner border.

2nd Case—A fine, white, raised line diagonally across the upper half.

3rd Case—Up and out near center; grooved, gray area.

4th Case—In the upper, outer quadrant a delicate branching line.

5th Case—A typical dendritic keratitis with large, T-shaped, central lesion.

6th Case—A clear, crescentic trough of fine, white points below, and parallel to the limbus.

7th Case—A subepithelial infiltrate outward from the center, 1 mm. in diameter.

8th Case—A linear, raised infiltration in the upper temporal quadrant.

9th Case—A small, central, three-pronged ulcer.

10th Case—A delicate, raised line, curved up and parallel to the limbus at the lower, inner quadrant. Three prongs.

Wilder's cases:

1st Case—An ulcer at the upper margin, extending over the center, with buds.

2nd Case—An ulcer from above downward.

3rd Case—Superficial ulcers arranged in a branching form, confluent in places.

The question suggests itself, whether the (ameboid) movement of leucocytes is so paralyzed by pigment granules and poison that they can wander only so far and then must remain stationary to block the lymph channels.

Third: The lesion in the beginning is never below Bowman's membrane, but is directly under the epithelium.

Later, it does extend sufficiently deep to almost invariably leave a scar. Hence those cases of keratitis caused by acute malaria recover quickly under quinine, by checking the cause of degeneration before the foundation for the epithelial structure (Bowman's membrane) is injured; but if the process has extended farther, quinine does not hasten the recovery, and although the patient may have no other malarial manifestations for months, nevertheless, the ulcer will not heal. I know of no other non-virulent ulcer which is so chronic as some of these cases.

The question which naturally arises here is how far the nerve fibrils influence the epithelial cells, remaining in situ. Whether their feet are not in reality nerve terminals. Certainly, those stains which bring out most distinctly the "Kitt substance" of the epithelium are those which are known as nerve stains, e. g. osmic acid, gold chloride, Ag NO 3.

Extreme chronicity may be, first, the result of what is suggested by the foregoing, viz.: that with interference of nerve-supply (either by a primary nerve lesion or by blocking of lymph-paths along nerve fibrils—here nerve degeneration would be a result rather than cause) the nourishment of the anterior layers of the cornea is impeded; or, second, it is barely possible that the continued action of the poison causes a general degeneration of all tissues in those layers (Bowman's membrane, nerves and epithelium).

The nourishment of the cornea proper takes place through its lymph spaces which contain fixed corpuscles, leucocytes and nerves. The nutrition for Bowman's membrane and the epithelium probably follows the paths of the nerve filaments, piercing Bowman's membrane and passing between the epithelial cells. Any poison would be more likely to affect those portions of the nerves farthest removed from the source of food supply, i. e., the bundles lying in the substantia propria which contain the lymph spaces and corpuscles would be less liable to injury than their fibrils distributed to the epithelium. The toxin would enter through the same channel as the nutriment.

THE DIFFERENT FORMS OF HEREDITARY SYPHILITIC KERATITIS AND THEIR TREATMENT.*

By ETIENNE ROLLET, M.D.

Translated by Adolf Alt, M.D.

THERE are few diseases which have been written about so much as interstitial keratitis. Hutchinson's ideas on the aetiology of this affection have been accepted and it is to-day admitted that in general we have to deal with a hereditary syphilitic keratitis. Even the synonyms reflecting the older ideas on this disease have been forgotten (scrofulous, cachectic keratitis); only those based on the clinical picture, or on pathological characteristics, are still retained (diffuse, disseminated, parenchymatous, deep and interstitial keratitis). Once recognized as being of a hereditary syphilitic nature, this disease would naturally fit into the class of syphilitic affections, which are treated by specific medication.

Fournier¹ says: "The indication is to fire all the canons, that is to give simultaneously mercury and iodides; later on the treatment may be alternated by giving mercury for three months, followed by iodides for three months, and so on. It is essential to give these remedies in a full dose."

Panas² says: "The vigorous and prolonged employment of mercury and the iodides constitutes the basis of the treatment. Therefore, one should prescribe in turn potassium iodide, Gilbert's syrup, mercurial inunctions and subcutaneous injections of bichloride, or better, biniodide of mercury. After 25 to 30 injections it is best to stop, to again resume three or four weeks later."

According to these citations, which I could multiply easily, there is here an indication for mixed treatment which may be termed severe and intense, and we must acknowledge that even if the parents of the syphilitic child have taken no mercury, this must be insisted upon in their offspring.

We are also told that this anti-syphilitic treatment must be prolonged. Fournier says: "We must be patient, because the disease lasts long, very long." Only recently Bandry³ wrote: "When called to a patient with parenchymatous keratitis, we must inform him and his family of the long

* *Revue Generale d'Ophthalmologie*, XXIII. No. 1.

duration of this disease—several months and sometimes several years.”

Contrary to these writers, others especially depend on a natural cure and are, therefore, much less enthusiastic as to specific medication. Gayet⁴ says: “Concerning this chapter of therapeutics, experience has taught us that we are desolately impotent. Usually, when local treatment is unsuccessful we fall back on general treatment. If iodide of potassium seems to be of some value, it surely does not bring about remarkable cures, and as to mercury, I have never thought its effect to be a certain one. In many cases I have tried mercurial treatment without obtaining any undoubted effect.”

What can we say of these contradictory opinions announced by these different clinicians concerning the efficacy of specific treatment in hereditary syphilitic keratitis? The first thing that strikes us is, that the practitioners who have the greatest confidence in the medication tell us beforehand that its action is very, very slow.

Is it not really classic, having prescribed a specific treatment for diagnostic purposes, to give it up after twice seven years, because its dissolving action is seen to be nil after the lapse of this time? Clearly, we have here no ordinary tertiary lesions to deal with which are easily dispelled.

It is my opinion that the authors I have cited, having treated various forms of keratitis of different origin by means of one and the same medication, must necessarily have obtained varying results. Neither do I believe that there is but one keratitis, but that there are several kinds of hereditary syphilitic keratitis. The future will teach us whether their clinical and pathological symptoms are distinct; at any rate I believe from now on that their internal treatment is absolutely not the same. It is true, as is admitted and as I have often been able to observe, that children, adolescents and even persons in adult life, attacked by interstitial keratitis very often come from syphilitic stock, but we forget to make distinctions. Thus, I have observed especially syphilis in the father, less frequently syphilis in the mother or in both parents. In summing up, I want to establish the following classification: 1, The affection of the cornea is of some non-specific origin in the descendant of a cured syphilitic.

2. The keratitis is part of a hereditary syphilis with mal-nutrition. 3. Keratitis in a case of virulent hereditary syphilis. Of course, I do not speak of the interstitial keratitis which is observed in acquired syphilis.

1. In the first case the father usually acknowledges having had syphilis six, eight, twelve or more years before marrying, before the birth of the child. This syphilis was mild, well treated, perfectly cured. At the age of eight or twelve years, the child has an interstitial keratitis without any blemish in the skin, bones or teeth. I believe such a keratitis can be an ordinary one and need not be referred to the former syphilis of the father, and that it falls under the category of those forms of interstitial keratitis, with the same clinical aspect, which we encounter sometimes in the descendants of alcoholics, of tuberculous parents and of individuals who absolutely never were syphilitic.

2. This is a keratitis in a hereditary syphilis with mal-nutrition. In young, and oftener in adolescent patients, such late manifestations of hereditary syphilis are found in the teeth or the nose; in others a hyperostasis of the tibia is found, or other dystrophies which are in no way influenced by a mixed treatment. An important point is that such a patient is never contagious; as he has had no secondary affections, he is not immune and may contract a syphilitic chancre, as many observations have convinced me.

3. This is the keratitis of a virulent hereditary syphilis. This is more scarce, since the individual often succumbs (70 to 80 per cent.) to the specific lesions which are so murderous in early infancy.⁵ This keratitis attacks an individual who has had this precocious hereditary syphilis at the nursing period. I think this keratitis of a virulent type appears earlier than the one due to mal-nutrition. I am just now treating such a case in my service at the Hotel Dieu. It is in a girl five years of age, both of whose parents had syphilis, who, according to the classic rule, herself had undoubted syphilitic symptoms (mucous and cutaneous syphilides), and to-day she suffers from the affection which we are here considering. In a case of keratitis from virulent syphilis, the subject had the contagion at birth and may present at the same time secondary affections and different sclero-gum-mous

and dystrophic lesions. Although such a patient might transmit a chancre, he never had one nor will he ever have one.

If these principles regarding the multiple origin of interstitial keratitis in the descendants of syphilitics are accepted, it is easily understood that specific treatment can produce happy results only when administered in a subject of virulent hereditary syphilis; that it will remain ineffective when prescribed in a dystrophic case or the case of the descendant of a cured syphilitic. That is exactly what I have observed, and from my practice I think that specific treatment is rarely indicated, because it is applicable only in the virulent cases, the number of which is restricted. In the other cases the internal treatment should be of a tonic and non-specific kind.

Finally, whatever may be the nature of the interstitial keratitis, local treatment, which is not given any prominence by the authors here cited, gives remarkable results when applied when the disease is established, and still better while the disease is at its beginning. In order to treat an interstitial keratitis it is by far the best to employ subconjunctival injections. For a long time biniodide of mercury⁶ and methylene blue⁷ have given me entire satisfaction. The blue is very diffusible and causes no pain. It can be injected every two days, the needle being inserted in front of the insertions of the four recti muscles. The oleate of biniodide of mercury is of a very energetic action; the irritation caused by it is insignificant, contrary to that of other mercurial salts. Through experiments made on rabbits, with the assistance of Mr. Dubreuil, with concentrated solutions of methylene blue, I have been able to see that when injected under the conjunctiva the blue was diffused into the cornea from the periphery to the center in a progressively decreasing dilution due to the interstitial fluids. The subconjunctival injections act, as it is said, by modifying the diapedesis or by revulsion; and I want to add to this the true mechanical and a microbicidal action of the fluid which penetrates into the corneal canals. Its modifying power is the greater since the lesion it is to combat lies in the periphery of the cornea. I do not dwell any longer on this subconjunctival medication, nor on the cases of keratitis which I have treated upon. With regard

to this subject the reader is referred to the thesis of my pupil, Dargein.⁸

My desire was to show that the so-called keratitis due to hereditary syphilis can be cured quite rapidly by a local treatment, thus saving the children or adolescents affected by this malady, from a general treatment of iodides or mercury, which, I think I have successfully shown, is perfectly useless in the majority of the cases.

¹ La syphilis héréditaire tardive, Paris, 1886. p. 205.

² Traité des maladies des yeux, Paris, 1894, vol. i, p. 247.

³ Baudry, Le Nord Médical, June, 1903.

⁴ Gayet, Eléments d'Ophthalmologie, Paris, 1893, p. 239.

⁵ E. Rollet, La syphilis des nourrissons et des nourrices au point de vue médico-légale, Arch. d'Anthropol. Crim., June, 1894.

⁶ E. Rollet, Des injections sous-conjonctivales de biiodure de mercure, Lyon Médical, Feb., 1899.

⁷ E. Rollet, Des injections sous-conjonctivales de blue de méthylène, Lyon Médical, Feb., 1901.

⁸ Dargein, Traitement des Keratites par les injections sous-conjonctivales (blue de méthylène, biiodure de mercure), Thèse de Lyon, Jan. 12, 1904.

A CASE OF OVER-CORRECTION OF CONVERGENT SQUINT WITHOUT OPERATION.

By SAMUEL THEOBALD, M.D.

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CASES of over-correction of convergent squint following operative procedures, though less common now-a-days than they once were, are not so rare as to make them noteworthy; but instances of a well-marked inward squint being converted into an outward squint, simply through the influence of glasses, are certainly very uncommon. And so it has seemed to me worth while to place upon record a case of this character which has recently come under my observation.

Master E., a lad, twelve years of age, was first seen January 30, 1901, when he was brought to my office for advice regarding the condition of his eyes. There was a fixed and marked convergent squint of the right eye, and there was given a history of asthenopia. The squinting eye was found to be decidedly amblyopic ($V = \frac{20}{100}$), and the sight of this

eye could be improved but little by glasses. A test under hyoscyamine, made the following day and repeated the day after, showed the total refractive error and the vision of each eye to be as follows:

$$\begin{aligned} \text{L. eye} &+ 3.25 \text{ s.} \bigcirc + .50 \text{ c. } 85^\circ \text{ V} \bigcirc^{20}_{25} \\ \text{R. eye} &+ 3.50 \text{ s.} \bigcirc + .50 \text{ c. } 95^\circ \text{ V} \bigcirc^{20}_{(90)} \text{ —} \end{aligned}$$

In accordance with my usual practice, I should have urged tenotomy, and should not have thought it worth while to attempt a correction of the squint by glasses alone; but, as a year previously I had succeeded in correcting with glasses a periodic convergent squint in a younger sister of the patient, I concluded to try the same method with him. Accordingly, after the effect of the cycloplegic had passed off, the following glasses, which somewhat over-corrected the manifest hypermetropia, were prescribed for constant use:

$$\text{L. eye} + 2.50 \text{ s.} \bigcirc + .50 \text{ c. } 85^\circ \bigcirc \text{ prism } 2^\circ, \text{ base out.}$$

$$\text{R. eye} + 2.75 \text{ s.} \bigcirc + .50 \text{ c. } 95^\circ \bigcirc \text{ prism } 2^\circ, \text{ base out.}$$

The patient was seen about a week after getting these glasses, when there was no appreciable change in the position of the squinting eye. Nearly two years elapsed before his next visit. He had worn his glasses systematically, and, in spite of the fact that the left lens had become misplaced, the base of the prism having been turned toward the nose and the axis of the cylinder to 95° , he had been free from asthenopia. As shown by the cover test, there was still, with the glasses as he had been wearing them, a slight residual convergent squint of the right eye, the vision of which was unchanged.

As a result of a re-examination of his refraction, this correction, for constant use, was prescribed, Jan. 5, 1903:

$$\text{L. eye} + 2.50 \text{ s.} \bigcirc + .75 \text{ c. } 75^\circ$$

$$\text{R. eye} + 3.50 \text{ s.} \bigcirc \text{ prism } 3^\circ, \text{ base out.}$$

He was not seen again, except to show me his glasses a few days after they were ordered, until December 29, 1903, nearly twelve months afterwards. He had worn the glasses constantly, and had been free from asthenopia. There was now, with the glasses on—and this was confirmed by the cover test—an evident *divergent* squint of the right eye. In view of this, his lenses were changed as follows:

L. eye + 2.25 s. \bigcirc + .75 c. 80°

R. eye + 3.25 s.

These about corrected the manifest refractive error in each eye, and gave for the left eye $V = \frac{20}{25}$ —, and for the right eye $V = \frac{20}{60}$ —, indicating a slight improvement in the sight of this eye. With this correction, the right eye was disposed still to squint outward, though at times there seemed to be binocular fixation in distant vision. After ten days the right eye was found to be still squinting outward, and, what was more remarkable, this outward squint persisted even when the glasses were removed. A month later (Feb. 5, 1904), there was no change in the position of the eyes in distant vision, but the cover test seemed to indicate a disposition to binocular fixation in near vision. He had, besides, suffered somewhat with headache after reading, which I thought due, probably, to an effort to establish binocular fixation. March 9th, with his glasses on, there was still a divergent squint of the right eye in distant vision and, most of the time, in near vision, though occasionally there seemed to be binocular fixation in near, especially in reading.

By the vertical diplopia test, and with a red glass before the left eye, there was at 20' an "exophoria," if it could be called so, of 10° to 11°, and at 12" of 4°. Without glasses, the right eye, as before, squinted outward in distant vision; and when the left eye was covered, and he fixed with the right eye, the squint shifted, in the usual manner, to the covered eye.

This case seems to me to possess several features of interest. In the first place, it shows very strikingly how great an influence glasses exert at times over the position of a convergently squinting eye. In the next place, it illustrates the pronounced indisposition to binocular vision which, as we all have had occasion to observe, exists in certain strabismic individuals. In some instances the difficulty in establishing binocular fixation, whether by the aid of glasses alone or by operation supplemented by glasses, is doubtless due to the amblyopia of the deviating eye; in others, to a slight uncorrected upward or downward squint of this eye; but in not a few it can be attributed only to a lack of disposition to fuse mentally images formed upon corresponding retinal points. This last

mentioned condition, probably, was a factor in my case: at all events, there was no vertical deviation, and the amblyopia, though marked, was not excessive. Another noteworthy feature was the persistence of the upward squint when the quite strong glasses which the patient was wearing were removed. This would not have been so remarkable if he had made no attempt to obtain clear vision by accommodative effort; but even when he was induced to distinguish small letters at 20', no change in the position of the deviating eye could be observed. Probably a change in this regard would have occurred had the glasses been left off for several days. Should the squint not disappear within the next few weeks, it is my intention to reduce further the strength of the spherical correction: and I am not without hope that in this way I shall be able eventually to secure binocular fixation.

As an addendum, it may be of interest to mention that the periodic squint in the case of the patient's sister, who when first seen was but five and a half years of age, was corrected by the following glasses:

L. eye + 4.25 s. \bigcirc prism 2°, base out.

R. eye + 4.25 s. \bigcirc prism 2°, base out.

These were subsequently changed to

L. eye + 4.25 s.

R. eye + 4.50 s.

with which she has, at the present time, not only comfortable binocular vision, but practically normal muscle balance. A favorable feature in her case was the existence of acute vision in the periodically squinting eye.

RUBBER-DAM DRESSING AFTER ENUCLEATION.

By L. R. CULBERTSON, M.D.

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THE removal of the first dressing after enucleation, when gauze is used, is nearly always very painful, and anything that prevents this is a great boon to such patients. Even when the gauze strips are saturated with vaseline, they will stick and cause pain in removing. Recently in reading of McKernon's method of spreading rubber dam over the

surface of the wound after a mastoid operation to prevent adhesion of gauze at the first dressing, I thought how useful it would be after enucleation. At the first opportunity I tried it and it was a great success. A piece of medium weight rubber-dam was cut round. Then I cut several very small holes in it from $\frac{1}{16}$ to $\frac{1}{8}$ inch in diameter (these to go in the back of the cavity) so as to allow any blood or pus to flow through and get on the gauze. The dam was then pushed back in the cavity and the iodoform gauze pushed in upon it, filling up the cavity.

The dam should be large enough to cover the conjunctiva of the lids. Before putting in the dam all hæmorrhage should be arrested with hot water or adrenalin (1—5000). Before the operation the dam should stand for an hour in 1—1000 corrosive sublimate solution. Just before dressing it should be rinsed in sterile water and dried in a sterile towel. It can be used at the second dressing, but the pressure used in introducing it may be painful to some. The dressing may be removed on the second or third day after the operation.

ON REMOVAL OF THE CRYSTALLINE LENS IN HIGH DEGREE OF MYOPIA, AS ILLUSTRATED IN SIXTY CASES.*

BY SIMEON SNELL, F.R.C.S. EDIN.

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University College, Sheffield.

FOUR years ago I contributed a paper to the discussion on the operative treatment of high myopia before the Ophthalmological Society, and which is published in the *Transactions* of that Society. I there dealt with twenty operations. Since then I have increased the number in which I have removed the crystalline lens to about sixty, and it is the experience thus gained that I propose bringing before your notice to-day.

The deplorable results associated not infrequently with high degrees of short sight are well known. The inconveniences attendant on the use of the necessary powerful

* Prepared for a meeting of the Yorkshire Branch of the British Medical Association.

glasses are great. Without their aid, those unfortunately afflicted with high myopia are well-nigh blind, and not infrequently having removed and deposited their glasses they are with difficulty able to find them again. To relieve such cases as here depicted the removal of the crystalline lens has been suggested and performed with success in this country and abroad during the last few years.

Donders regarded the cure of myopia as belonging to the *pia vota*. Before his day the removal of the lens had been suggested, but, writing in 1864, Donders treated the proposal with ridicule, and insisted that such a momentous undertaking "would exhibit culpable rashness." The forty years which have elapsed since Donders wrote these words have witnessed many changes in ophthalmic surgery. Asepticism, which has enabled so many operations to be accomplished with safety in general surgery, has extended its benefits, if in a less degree, to the operative surgery of the eye, and the attendant risks in careful and skillful hands are much less now than formerly.

Within defined limits the removal of the crystalline lens for high degrees of myopia may now, I believe, be regarded as a recognized and valuable method of treatment. By its means the myopia will be either entirely obliterated and the eye become emmetropic or a varying degree of low myopia or a low degree of hypermetropia will result, according to the original degree of shortsight.

A consideration of my cases will bring into view several points which should be noticed. The number of patients operated upon has been 40, the number of eyes 59. It may often be well to be content with only treating one eye, and my rule has been to take the worst eye. Frequently, however, my experience is that after having undergone operation on one eye the patient has been so pleased with the result that urgent application is made for the other to be similarly treated. Domestic servants are numbered among those who have returned after one eye has been operated upon and have been desirous to have the second one done. I am always more willing to accede to such wishes in young adults. In one instance, however, a married woman, Mrs. D., aged 48, I treated both eyes four years ago with most gratifying results.

The number of operations reviewed in this article is 59. There were 40 patients: in 21 only one eye was treated and in 19 both eyes were operated upon. Of the 40 patients, 11 were males and 29 were females. Of those who underwent operation in both eyes 13 were females and 6 were males.

One patient was aged 48, but this was the only instance over 40. Of the others, one was 37, another 35, and two 32. Those between 20 and 30 numbered eighteen, as follows: three aged 20, one aged 29, four aged 28, two aged 27, three aged 26, one aged 25, one aged 23, two aged 22, and one aged 21. Under 20 there were seventeen, namely: two aged 19, five aged 18, one aged 17, three aged 15, one aged 14, one aged 13, two aged 11, one aged 10, and one aged 9.

Of the instances in which the degree of myopia is accurately recorded, I find that 28 operations were performed on eyes with 20 D and above, namely, 15 for 20 D, 1 for 21 D, 2 for 22 D, 1 for 23 D, 1 for 24 D, 2 for 25 D, 3 for 26 D, 1 for 27 D, and 2 for 28 D. The lowest degree for which removal of the lens was performed was 10 D, and this in one instance only. There was one eye for 11 D, 2 for 12 D, 2 for 13 D, 3 for 14 D, 1 for 15 D, 3 for 16 D, 10 for 18 D, and 1 for 19 D. The number, therefore, between the eyes of 10 and 19 D inclusive was 24. It will thus be seen that practically all the operations have been performed on eyes having 12 D and more degrees of myopia, the two exceptions being 10 D and 11 D respectively. Moreover, the greatest number of operations have been for 18 D and upwards, 18 D being the degree in 10 eyes and 20 D in 15.

If the operation be limited, as I believe it should be, usually, to cases of myopia of 14 D and upwards the total number of suitable cases presenting themselves must always be a comparatively small one. In this connection I have taken from the casebooks of my private practice the degrees of myopia in 3,162 consecutive patients or 6,324 eyes, a number which should give a fair idea of the proportion of the different degrees of myopia. The cases were roughly divided into those above 10 D and those of 10 D and under. If the division had been made at a higher degree of myopia, which, strictly speaking, it should have been, as, save in exceptional instances, the operation would not be performed for less than 13 D or 14 D, the total number of instances suitable

for operation as far as the degree of myopia is concerned would be decidedly less.

Of these 3,162 patients I find that in 1,159 the degree of myopia was equal in each eye. In 2,003 the eyes were unequal in refraction; that is to say, that while myopia was present in one eye it was so to a higher degree in one eye than the other, or in some the second eye may have been emmetropic, or hypermetropic, but the greater number would be myopic. Of these 2,003 eyes the degree of myopia was higher in the right eye in 1,029, and in the left in 974. Of the total number of eyes under review, namely, 6,324, there were 320 in which the degree was more than 10 D, or a trifle over 5 per cent. The record of my infirmity patients would, I expect, show a larger percentage of the high degrees of myopia, as those with the low degrees less frequently seek advice there than is the case in private practice.

Extraction was deemed unsuitable, and in no instance has it been adopted. In each case the transparent lens has been needled, and at the end of a week, sometimes more or less, when the lens substance has become sufficiently broken up, an incision with a broad needle has been made a little distance inside the periphery of the cornea, and the softened lens has been allowed to escape, or has been coaxed out with the aid of a curette. The pupil has previously been dilated with atropine, and by keeping the situation of the corneal wound inside the limit to which it dilates, the danger of entanglement of the iris in the wound is materially lessened. This operation is similar, of course, to that frequently performed for zonular and other forms of cataract. In all cases a watch must be kept for increased tension, which is liable occasionally to set up by the swelling of the lens. In a few of my cases glaucoma has in this way supervened. Removal of the broken-up lens was, however, promptly performed, and was followed by immediate subsidence of the pain and sickness, and with excellent visual results.

When operating, endeavor is, of course, made to remove as much of the softened lens matter as will escape without undue pressure on the globe. What remains, however, will undergo absorption, but a further needling may be required. Needling may also be necessary for opaque capsule and it is therefore important to bear in mind that treatment in some

cases may be somewhat prolonged. In one of my early instances I was perhaps hardly sufficiently alive to the importance of this and operated rather against time, as the patient was leaving England.

If due regard be paid to asepsis and the use of sublimate or some other antiseptic solution which are essential to eye operations, the dangers attendant on this operation are trifling. The introduction of any suction apparatus is altogether unnecessary, for by gentle coaxing the softened lens matter readily comes away through the corneal wound. It is desirable, however, that after the needling operation the patient be kept under close observation, for, as mention has already been made, in some instances the swollen lens is apt to induce increased tension as signified by pain and sickness, and the immediate performance of the second operation for the removal of the broken-up lens will be indicated. A free opening of the capsule is practiced, because it is held that by permitting the broken-up lens to escape into the anterior chamber increased tension is less likely to be induced. This is not, however, the only period that it is necessary to be on one's guard against the onset of increased tension.

In a certain number of cases after the usual operative measures have been completed and the pupil is free, or nearly so, of lens matter, increased tension may occur. In these instances atropine has very properly been used to maintain a dilated pupil whilst the remnants of the lens were undergoing absorption. The atropine may be discontinued and eserine substituted, but it will, in my experience, fail frequently to overcome the glaucomatous condition. The best plan is to tap the anterior chamber, and to repeat if necessary the paracentesis. In the few instances that increased tension has arisen in the circumstances just now mentioned, paracentesis has acted well, and the results in those cases have been among my best.

The operation performed in my cases is similar to that practiced for lamellar cataract, and the dangers are the same. A bead of vitreous may present at the wound, but this should very rarely occur if care has been taken to limit the tearing of the capsule to the anterior capsule, which should readily be done, and also if too great pressure on the globe is avoided when the lens is coaxed out by the curette.

My practice has been to indicate to a patient the advantages which may be gained by operative measures, but at the same time to point out that to achieve the benefits he or she must be prepared to face the risks which, however, are not great. The decision is left to the patient.

Some authors have alluded to the danger of detachment of the retina resulting from removal of the crystalline lens for high degree of myopia. I have no experience of extraction of the lens in these cases, and cannot therefore say whether it is a danger by that method or not. All my cases have been treated in the manner I have described, and certainly detachment of retina is not a danger of moment in my experience. I recollect only two instances; one was mentioned at some length in my paper before the Ophthalmological Society.

CASE I.—The patient was a young woman aged 25. The lens was needled, and subsequently evacuated in November, 1897. The result up to May, 1898, was excellent, myopia of 22 D had gone down to 2 D, and vision at this time was $\frac{6}{24}$. Shortly after this, however, owing to the serious illness of a near relative, the patient had very arduous night and day nursing thrown upon her. Vision rapidly deteriorated, and on June 8th it was reduced to $\frac{3}{60}$. Besides some films in the vitreous, no gross changes were noticeable in the eye. Vision remained at this point or a little worse for some months, but she had not been under examination for some time. It should be mentioned that when the lens matter was evacuated a small amount of vitreous escaped.

CASE II.—The second was that of a domestic servant. Both eyes had been operated on with excellent results. A year or more afterwards detachment of retina occurred in one eye. At this time she was in very feeble health. The other eye has remained good as far as I have heard.

These are the only instances of which I have either record or recollection in the 59 eyes which have been operated upon, and many of my cases have been under observation more or less for several years. Myopic eyes—especially the high degrees which are dealt with in this paper—are, it is well known, prone to detached retina. They are cases in which a sword of Damocles is always hanging over the heads. Even, therefore, if the percentage was much larger, as it has

been in some published records of instances in which detached retina has occurred after varying periods subsequent to the operation, it could hardly be regarded as discrediting the operative methods here advocated.

The results of a successful operation to the patient will be that vision is as good or better without glasses for distance as it was previously with their assistance. The myopia will have disappeared or be present only in low degree, or there may be weak hypermetropia, according to the amount of myopia originally existing. It would be very unusual for a patient not to express his or her gratification with the change that has been brought about. There are few subjects in ophthalmic surgery that elicit such expressions of gratitude as do these operations for the relief of myopia.

I give here an extract from a letter received from a patient operated upon some few months since. She was a teacher, aged 28, and the degree of myopia in each eye was 28 D. The right eye only was treated. Before operation, with correction with —28 D, $V = \frac{6}{18}$; after operation, without the aid of glasses, $V = \frac{6}{12}$.

“The benefits received from the operations are so numerous that I hardly know how to specify them. The operations, of course, to me appear nothing short of a miracle. The fact that I had worn exceedingly strong glasses for twenty-two or twenty-three years emphasizes this. Prior to the operation objects a few yards distant were quite unrecognizable; clear vision was only obtainable an inch or two from the eye. The uncertainty of locating the outline of objects caused me great trouble, inconvenience and, at times, even fear. For instance, in crossing the road the edge of the pavement was always uncertain. The same may be said of steps to vehicles, stairs, etc. Nothing of that uncomfortable uncertainty remains, all things are now clear. I see clearly, distinctly, and have quite a long range of vision; not only that, but the continual tired, aching feeling, and fearfully hot sensation have entirely gone; and it is saying a great deal when I say that whereas for many years my eyes have been an ever-present feeling, I now sometimes forget that I have eyes, so very natural and painless are they.”

[Since this article was written I have operated on four additional cases, all successful; three females, aged 26, 15, 9, one boy aged 10; the degree of myopia of each in this order being 18 D, 14 D, 18 D, and 15 D.]

ABSTRACTS FROM MEDICAL LITERATURE.

By W. A. SHOEMAKER, M.D.

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THE PHYSIOLOGY OF THE SYMPATHETIC IN RELATION TO THE EYE.

G. E. De Schweinitz (*Jour. A. M. A.*, Jan. 30,) from a review of the entire literature of the subject, and from the opinions of the various authors quoted, offers the following conclusions:

1. Although lacrimal secretion may be caused by excitation of the sympathetic, and increased lacrimation by section of the cervical sympathetic or removal of the superior cervical ganglion, the sympathetic itself should not be considered the nerve of secretion for the lacrimal gland.

2. Dilatation of the pupil is probably caused by contraction of a set of radially arranged muscular or contractile fibers, the so-called dilatator pupillæ, which is supplied by the sympathetic, and by inhibition of the sphincter of the iris. The dilating impulse transmitted to the iris passes through the cervical sympathetic and in general terms along the mydriatic tract of the pupil, which proceeds from a center in the medulla as far as the second dorsal nerve, follows its communicating branch to the cervical sympathetic, and arrives at the internal carotid plexus, from which point it passes to the nasociliary branches of the nasal nerve, which as the long ciliary nerves supply the muscular tissue of the iris.

3. Although experimental and clinical evidence favors the presence of a center situated between the spinal cord and the exits of the sixth cervical and fourth dorsal nerves, to which Budge relegated the origin of the pupil-dilating fibres of the sympathetic, its existence has not been definitely proven.

4. Although the nature of the ciliary ganglion has not been positively determined in any one species of animal, and, although it differs greatly in different species, the weight of evidence is in favor of the ganglion belonging to the sympathetic system, at least in so far as man is concerned. The root fibres which belong to the oculomotor end in the ciliary

ganglion, where a new neuron begins for the fibers which pass to the ciliary muscle and the sphincter of the pupil, i. e., the oculomotor does not act directly on the sphincter of the pupil, but only in association with the ciliary ganglion. There is a certain amount of evidence that this ganglion is related to the pupil movements in the form of a center, and it probably contains cells which are active in the sensibility of the cornea, but lesions of the ganglion itself, although they have been considered by Grosz to be the basal cause of true neuro-paralytic keratitis, have not been proved to sustain this position by experiments, inasmuch as trophic changes have not been observed after extirpation of the ganglion. Removal of the ganglion has little or no influence on intraocular tension, and its excision is not a rational procedure for the relief of glaucoma.

5. There is no satisfying evidence that the sympathetic is related to the function of accommodation, and it has not been proved that the sympathetic has any power in causing negative accommodation, nor has it been demonstrated that alterations in refraction noted after stimulation of the sympathetic are due to actual change in the lens.

6. Electrical stimulation of the cervical sympathetic produces at first an increase and later a decrease of intraocular tension, the increase being probably due to an effect on the vessels of the eye. Slow-acting, mechanically produced irritation of the sympathetic causes a rise of tension, which, according to Ladoto, is independent of dilatation or constriction of the blood vessels, and also independent of the state of the pupil. Section of the sympathetic, or extirpation of the sympathetic ganglion, is followed by a fall of intraocular tension, which probably depends on vascular and, perhaps, muscular changes. The lowering of tension is more decided after excision of the ganglion than after section of the sympathetic cords, but in either case the effect is a temporary one, and may not last more than a few days, and sometimes disappears within a few hours.

7. Electrical stimulation of the cervical sympathetic produces on the side stimulated a dilatation of the pupil as a result of contraction of the dilatator pupillæ, associated, perhaps, with an inhibition of the sphincter. At the same time there may occur on the opposite side a contraction of the

pupil, which either depends on the consensual pupil reflex, or represents a reflex transmitted through the sympathetic fibres joining the cranial nerves in the region of the cavernous sinus.

8. Electrical stimulation of the cervical sympathetic causes retraction of the nictitating membrane and proptosis, owing to the action transmitted to the unstriated muscular fiber. In contrast to the general rule, irritation of the sympathetic in rabbits causes a retraction of the eyeball in the orbit, which has been attributed by Heese to a contraction of the orbital vessels and the anemia which this causes.

9. Electrical stimulation of the cervical sympathetic is followed by a contraction of the blood vessels of the conjunctiva and of the iris, and perhaps by alteration in the caliber of the vessels of the retina, although observations on the last-named phenomenon have been extremely contradictory.

10. Stimulation of certain areas of the brain cortex causes dilatation of the pupil, associated, if the cervical sympathetics are intact, with all the symptoms of stimulation of the cervical sympathetic. Division of the sympathetic stops the other symptoms, but not the dilatation of the pupil, which is supposed to be due to inhibition of the tonic action of the third nerve (Parsons).

11. Sympathectomy or gangliectomy causes the following effects: Myosis, narrowing of the palpebral aperture, projection of the nictitating membrane, retraction of the globe of the eye, hyperemia of the vessels of the conjunctiva, increased lacrimal secretion, diminished intraocular tension, certain ophthalmoscopic and microscopic lesions in the eyeground, and possibly trophic disturbances.

12. The symptoms of sympathetic section or paralysis lessen after a time, myosis being the most permanent, lasting sometimes for years. The degree of permanence, however, of the paralytic phenomena varies much in different animals.

13. Myosis is greater after excision of the cervical sympathetic cord, because it is probable that a certain tone is exercised by the ganglion; that is, that it has a different, and, as it were, a stronger action on the eye than the nerve trunk itself (Levinsohn).

14. All the phenomena of paralysis of the sympathetic

nerve, especially the contraction of the pupil, which follow extirpation of the superior cervical ganglion gradually become less marked and may disappear or even give place to the opposite condition, especially if the animal is anesthetized or subjected to sensory or emotional stimuli. In other words, extirpation of the upper cervical ganglion causes the symptoms of sympathetic paralysis which may disappear and give place to the signs of sympathetic excitation. Such paradoxical pupillary dilatation may depend on degenerative processes in the post-cellular nerves of the ganglion (Langendorff).

15. The myotic pupil, which follows sympathectomy or gangliectomy, responds to light stimulus, is still further contracted by eserine, and may be dilated by atropine. It is uninfluenced by cocaine, which, however, may exercise its influence in widening the contracted palpebral fissure.

16. A considerable excision of the sympathetic must be made in order to prevent a rapid regeneration.

17. Narrowing of the palpebral fissure, ptosis sympathica, and enophthalmos are probably due to relaxation of Müller's muscle, aided, perhaps, by atrophy of the orbital fat. It has not been proved, although it has been asserted, that there is an actual reduction in the size of the globe, that is, a true microphthalmos, under these circumstances.

18. Sympathectomy or gangliectomy may cause increased vascularization of the eyeground, perhaps hæmorrhages in the ciliary body and ciliary processes, and alteration in the retinal ganglion cells.

19. Puncture of the restiform body produces just the opposite effects of destruction of the sympathetic (Dupuy).

20. Nicotine paralyzes the activity of ganglionic nerve cells in the sympathetic. Cocaine dilates the pupil by stimulating the mydriatic nerve endings in the iris. Atropine dilates the pupil, partly by a paralytic action on the oculomotor endings of the sphincter, and, perhaps, by a stimulant action on the sympathetic nerve fibers, or more likely, by causing a general paralysis of the unstriated pupillary muscle. Instillations of adrenalin, ordinarily inactive in causing dilatation of the pupil, become exceedingly active when the sympathetic is cut or the ganglion removed, and cause under these circumstances marked dilatation of the pupil.

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ORIGINAL ARTICLES.

A CASE ILLUSTRATING THE DANGER IN EXTRACTING FRAGMENTS OF METAL FROM THE VITREOUS CHAMBER BY A POWERFUL MAGNET.*

By S. D. RISLEY, M.D.

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IN July, 1902, I presented a brief paper (*Transactions American Ophthalmological Society*, 1902) on "The Extraction of Metallic Fragments from the Vitreous Chamber," in which I discussed the relative merits and dangers of removal, by relatively weak magnets through a scleral puncture at the known site of the foreign body, and by means of powerful magnets by which the fragment was drawn forward through the intervening tissues into the anterior chamber, and thence removed through a corneal section.

The group of dangers which cluster around a scleral puncture I placed in contrast with the possible, theoretical, dangers attendant upon the latter procedure, using the following language: "It is worthy of inquiry whether the probabilities of permanent injury to the eye which have been enumerated are greater than those presented by extraction through the anterior chamber with the aid of a powerful magnet. In case I, for example, the most favorable of the group for this procedure, since the injury was recent and the foreign body

* Read before the section in ophthalmology, College of Physicians, March 15, 1904.

could not therefore have been fastened in situ by the inflammatory products, there can be no question but that the giant magnet, placed near the pole of the cornea, would have drawn the fragment into the anterior chamber, if manipulated with skill, on a tractable patient. The fragment of steel was lying in the bottom of the eye and resting on the retina just back of the ciliary processes. The magnet, therefore, must have dragged it with its sharp and ragged edges forward through a hitherto uninjured portion of the vitreous, over the ciliary region, and through the suspensory ligament or zone of Zinn, thence through the posterior chamber between the iris and lens, necessitating its gliding over a portion of the delicate anterior capsule of the lens before emerging into the aqueous chamber. On the way there would be danger of entanglement in the ciliary processes, or the posterior surface of the iris, or of injury to the lens capsule. But once safely through these possibilities, it would remain to make an opening in the cornea for its final delivery. This would also involve the opening of the ball, the emptying of the anterior chamber, and the dragging of a foreign body away from a close imprisonment between the iris and the cornea, and the consequent traumatism of these tissues, not to mention the possibility of hernia of the iris or anterior synechia during the process of repair. Added to these considerations is the possibility of the foreign body having been impure, so that the dangers of infection would have been greatly enhanced by a progress through a new and hitherto uninjured pathway through the tissues. In cases II, III and IV an additional factor was introduced. The foreign body had been present long enough to become fastened to the retina by inflammatory products. It is probable that to have dragged these inward away from their attachments would have endangered retinal separation and hemorrhage quite as much as a meridional section through the sclera at the site of the foreign body."

At the time these inquiries were formulated they were based upon purely theoretical considerations so far as my own experience was concerned. I have now to report a case which goes far to justify the fears then entertained.

E. G. C., aged 23, a machinist, came to the Wills Hospital, February 10, 1904, with the history of having been

struck in the left eye by a piece of casting two weeks before. He presented a note to me from Dr. Lewis H. Taylor of Wilkesbarre, who was uncertain as to the presence of a foreign body within the eye. The uninjured eye showed marked photophobia and lachrimation aggravated by any attempt to see near objects. $V = \frac{6}{19}$; with the injured eye he could count fingers uncertainly at 9". There was deep ciliary injection; the ball was tender to palpation. The anterior chamber was of normal depth, but there was a gray, irregular scar about $2\frac{1}{2}$ mm. in length near the pole of the cornea. The iris was swollen, gray and lacked luster. There were three broad, firm, posterior synechiæ, the largest being above where the iris was firmly bound to the anterior capsule and had evidently been injured by the foreign body. The lens was swollen and partially opaque. The location and appearance of the wound in the cornea, iris and lens suggested the possibility that the foreign body had punctured these tissues without deeper penetration. The man was firmly convinced that it had been removed from the eye. He brought an unsatisfactory skiographic negative taken near his home, which unfortunately did not aid in either localizing the body or certainly determining its presence.

The eye was cocaineized and he was placed before the Haab magnet, primarily to determine the possible presence of a metallic substance. He suffered severe pain when the eye was brought to about 10 inches from the tip of the magnet. The distance was slowly and cautiously diminished and the current carefully controlled, intervals of complete rest being secured by entirely cutting off the current. In a few moments the lower temporal quadrant of the iris was seen to bulge forward and the current was quickly cut off. The patient was then instructed to look strongly downward, and the magnet was tilted so that the line of direction of its traction would be exerted upward and outward, so that, if possible, the fragment of metal might be drawn along the posterior surface of the iris and into the pupillary area between the iris and lens. The current was slowly turned on and the tip of the magnet carefully approached to the eye. The man suffered intense pain, beads of perspiration standing on his brow. When a distance of approximately 3 inches between

the magnet and the corneal pole had been reached, the foreign body, with startling suddenness, flew with the impetus of a bullet and fastened itself to the conical extremity of the magnet with a portion of the iris still clinging to it. It had emerged through the old corneal wound, in which the remainder of the iris was found entangled, and was withdrawn, only a small triangle of iris remaining in the eye at the site of the original injury, where it still remains adherent to the lens.

The man was placed in bed, atropia instilled and continuous cold compress applied. The eye recovered from its terrible injury without noteworthy incident. At the end of the week he was much pleased with the unexpected vision remaining, but this has already diminished, a fact which may be accounted for in part by the denser opacity of the lens: but it is probably due to detachment of the retina and accompanying degeneration changes. The foreign body had been present two weeks and inflammatory reaction had been marked. It is, therefore, probable that it was adherent to the retina in the region of the ciliary processes, in the lower temporal portion of the eye. Time was not taken to secure a careful localization because of the rapidly progressing irritation of the other eye. Had this been done, and the body been extracted through a scleral puncture, I can but think that the traumatism would have been much less than that suffered from the powerful traction force of the magnet, which was sufficient to drag it from its bed of lymph and cause its violent projection through intervening structures. The result would probably have been in some measure less disastrous with a smaller fragment. The one in question had ragged edges, was rhomboidal in form, weighed approximately 2 grains, and was in its greatest diameters $3 \times 5 \times 2$ mm. The eye is now free from pain and tenderness, and is nearly white. There has been no symptoms of sympathetic irritation since the removal of the foreign body, notwithstanding the serious traumatism the eye has sustained.

MALIGNANT GLAUCOMA.

BY W. H. SEARLES, A.M., M.D.

OSHKOSH, WIS.

I DO not remember to have seen a report of a case of this form of glaucoma that was ever successfully treated, although I have met several instances of total blindness due to this disease. There is no prodromal period, and the opportunity to save the eye is quickly passed. Again, to perform an iridectomy under such conditions is perhaps the most difficult of any that we have to do upon the eye. I have met two cases in my 24 years of practice, the treatment of which may be of interest to the reader.

Mr. C., age 28, married, a painter, and in robust health, had never had any previous trouble with his eyes. He fell asleep after dinner on the floor where the wind blew over his face and head. He had been asleep for an hour when he was suddenly awakened by a sharp pain in the right eye. He was brought to my office by Dr. Steele in less than an hour from the beginning of the attack. The eye was now stony hard, the pupil widely dilated and crowded against the cornea. He was in the cold sweat of intense suffering and totally blind in this eye.

Paracentesis was done at once. He was then taken home and put to bed, when he was speedily brought to the sweating stage by fluid extract jaborandi and stimulants which relieved the pain somewhat. Hot water was also applied directly to the eye for five minutes at a time every fifteen minutes, followed by 2 per cent. atropine in 4 per cent. solution of cocain. After two hours' work he was put to sleep with a hypodermic of morphia, from which he awoke much better. I attended this man for ten days, when he made a complete recovery of his vision. Atropine-cocain was used from start to finish: jaborandi 20 drops at bed time, followed by morphia if necessary, with quinine during the day.

Mr. H., age 24, single, in perfect health, called me up at 5 a. m., suffering intensely in the right eye. He went to bed at 11 p. m. and to sleep with no indication of eye trouble. This eye, however, was blind from a corneal wound which had occurred ten years previous. Most of the cornea was covered

by a dense leucoma and the iris was probably adherent. He had had attacks of pain before, which hot water had always subdued, but had failed this time.

This attack began at 3 a. m. The eye was now very inflamed, with highest tension. I feared panophthalmitis and advised enucleation. This he refused and asked for medical treatment. I directed him to bed and to continue the hot water and gave him atropine to drop in the eye every half hour. I saw him four hours later. The supra-orbital nerve was now highly inflamed and the upper lid red and œdematous. I again insisted that the eye must come out, as it had made no improvement. He still wanted more time. I now began a systematic use of hot water in the eye itself, followed by the atropine every fifteen minutes for one hour and then turned to jaborandi and morphine, which gave him a refreshing sleep of several hours and from which he awoke in every way improved.

This man, to my great surprise, recovered. Two years later he had had no return of the disease and declared his eye had not felt so well in years.

In a general way I have found this treatment effective in all forms of glaucoma in subduing the inflammatory side of this disease. Quinine or any anti-neuralgic remedy should be used at regular intervals. The treatment seems to be ideal and a complete substitute for iridectomy, barring complications. I have not lost a case in the past fifteen years, which was not true before when I relied on surgery. Let me illustrate by a patient which is still under my care at this writing.

Acute inflammatory glaucoma.—Mrs. P. is 66 years of age. The left eye was removed 30 years ago. She had made a poor recovery from an attack of the grip November 25th last. She complained so much of pain in her eye and failing vision that her physician sent her to an oculist who fitted her with glasses, but they only increased the pain if she attempted any near work. I saw this case February 20th. For ten days previous she had suffered very greatly from pain in her eye and head, in fact in her whole body. She had had but little sleep and was now enveloped in a fog. Here is what I found: Pupil dilated to twice the normal

size: tension + 2: steamy cornea: green reflex and shallow chamber. The ciliary veins were varicose, with several hæmorrhages upon the eyeball. The eye was tender and all movements were painful: the media very hazy and the retinal veins swollen.

Here is a case of glaucoma in which the immediate cause is accommodative effort in an eye weakened by sickness of two months' standing. The treatment in the office was as follows: Atropine 2 per cent. was applied to the eyeball and rubbed in with my favorite spatula. Internally, a Dr. Gross tablet without morphia. Smoked glasses were put on, and the patient was sent home and to bed. Hot water was then applied according to the method of Dr. Connor of Detroit, as already indicated, followed by atropine each time till maximum dilatation was secured, when 15 drops of fluid extract of jaborandi was to be taken, followed by morphine if necessary to get eight hours' sleep. Later, she was to take another Dr. Gross tablet and wait till I came. I did not see her for twenty hours. According to every authority, the use of atropine is plainly forbidden in such a case. It is a mistake, however, as I know, for I have been over this ground too often. When I got to her home she met me at the door with a smile. She had had the sleep, and did not have to take the morphine. The disease was conquered, and my routine treatment for the next four days was as follows: Atropine once a day, half a Dr. Gross tablet three times a day, and jaborandi 15 drops at bed time, with morphine in reserve. At the end of the fourth day all hypertension was gone, also all pain through the body, and vision was fully restored. She said she was well again for the first time since November 25th.

Fifth day: This woman, contrary to my strict orders, went about her home work, visited with her neighbors, and dared to take up her sewing again, with the eye yet under the control of atropine. She collapsed worse than ever. I have met this same trouble before. The ignorant think you are running a bill for nothing, they get well so quickly and easily. I now added cocain to the atropine and began all over again, with morphine added to the jaborandi. I lost a whole week, but got back all right with a patient awful

weak," as she said, and very humble also. Here is all the trouble with atropine in glaucoma. It is not the drug but the patient. The wear and tear of the nervous system by this time had become so great that I now called to my aid McArthur's hypoph. of lime and soda and gradually stopped all other treatment, using the atropine-cocain once in two or three days and reducing the jaborandi to 10 drops at bed time. March 5th: the patient was well. No more atropine at present, but I shall keep her under it for two or three weeks longer. It will take a month more after that before I will allow any accommodative effort.

These cases do not recover quickly from atropine. That glaucoma occurs coincidentally with the exhibition of atropine is most true, as happened in this case, but it is due to an entirely different cause than the one recognized, namely, obstruction by the way of thickening of the iris base. The glaucoma charged to the use of atropine can always be quickly cured by the further exhibition of atropine.

Atropine is to the eye what splints are to the fracture, and we should no more make use of the one than the other, while under such control. The use of atropine under this precaution as an inflexible rule is perfectly safe, and wonderful in its results.

Atropine now comes to the front in a new role. It is to become our chief weapon against glaucoma in meeting its inflammatory side.

Atropine is anti-inflammatory, always, because it contracts bloodvessels and reduces secretion and, of course, swelling and tension as well.

Atropine in its final effect upon the uveal tract—which is really a pathway of bloodvessels—is, then, not one of obstruction of the angle, but of opening it. Every glaucoma has to reckon with this uveal tract bloodvessel system.

Atropine is then anti-glaucomatous, and there is no other drug at the present time to be compared with it.

Atropine removes for the time being one side of the iritic angle, in maximum dilatation, as completely as the best possible iridectomy, and, better still, does it throughout the entire circle. At the finish it leaves no mutilations behind.

Atropine-cocain reduces volume, blood supply, secretion,

intra-ocular tension, soothes pain, improves nutrition and secures complete rest, and hence is the logical answer to every glaucomatous process. In every glaucoma there is always sluggish absorption, and we turn logically to jaborandi to meet this defect.

The writer has "sailed through bloody seas" to reach his present position and is fearless of all contradiction.

PAMPHLETS RECEIVED.

"Acquired Hydrophthalmus." By E. Stieren, M.D.

"Annual report of the Surgeon General." Fiscal year 1902.

"Eye Complications that at Times Attend Measles." By G. F. Suker, M.D.

"A Case of Enucleation for Glioma of the Retina." By Ch. A. Oliver, M.D.

"Frontal Sinusitis and Cause of Accommodation Paresis." By H. M. Fish, M.D.

"Frontal Sinusitis and Ophthalmoplegia Interna Partialis." By H. M. Fish, M.D.

"Thirty-fifth Annual Report of the Brooklyn Eye and Ear Hospital." 1904.

"Clinical Reports by the Surgeons of the New Amsterdam Eye and Ear Hospital." 1903.

"Brief Report on the Treatment of Gonococcal Conjunctivitis." By Ch. A. Oliver, M.D.

"Thirty-Fourth Annual Report of the New York Ophthalmic and Aural Institute." 1903.

"Circumcorneal Hypertrophy (vernal conjunctivitis) in the Negro." By S. M. Burnett, M.D.

"Epithelial Cystoma of the Conjunctiva (dermo-epithelioma of Parinaud)." By E. L. Oatman, M.D.

"Can an Ophthalmic Examination Aid the Life Insurance Examiner in His Work?" By G. F. Suker, M.D.

"Decapsulation of the Kidney With Reference to the Concomitant Intraocular Complications." By G. F. Suker, M.D.

A MODIFICATION IN THE SHORTENING OF THE EYE MUSCLE WITH THE PRESERVATION OF ITS TENDON.*

BY GEORGE F. SUKER, M.D.

CHICAGO, ILL.

Professor of Ophthalmology, Post Graduate Medical School; Instructor in Ophthalmology, College of Physicians and Surgeons (Univ. of Ill.).

THE operation about to be described is but a modification of the method of shortening the eye muscles as first described by J. F. Noyes, of Detroit, at a meeting of the American Ophthalmological Society in 1874. The mere fact that in the Noyes' operation and the one about to be detailed, either the whole or a part of the tendon is preserved without disturbing its anatomical insertion, will commend the operation as being applicable in certain cases of strabismus.

The technique involved and the principle underlying both are quite similar. This operation is indicated mainly when it is desired to operate upon the lateral recti muscles; mainly upon the recti, because they have the longest tendon, therefore permit of a greater latitude in shortening the muscle. The operation is quite applicable in such cases when the amount of shortening demanded does not exceed much over one-half the length of the tendon. In other words, in all such cases where the degree of convergence or divergence is not too excessive. Briefly, it may be said to be indicated either to its fullest extent or in part in all such cases where the present methods of tendon advancement or muscle shortening are used or a tenotomy with an advancement is employed.

The operation is performed as follows:

First: Make a conjunctival incision parallel to the long axis of the muscle, similar as in any tenotomy, beginning the incision a line or two in advance of the tendon insertion and extending backward to at least the beginning of the muscle.

Second: Make an incision into the capsule of Tenon, also parallel to the long axis of the muscle.

Third: Pick up the muscle with a strabismus hook or a Prince's advancement forceps.

Fourth: Pass a double needled silk suture—one from above, the other from below—through the edge of the muscle, picking up a small loop. This leaves the central nutrient

* Read before the Chicago Ophthalmological Society, April 12, 1904.

artery intact. These sutures must be passed just back of the beginning of the tendon (or in the substance of the tendon proper, if but a partial shortening is desired) so as to avoid their tearing out, as happens when such sutures are not guarded by tendinous structures. The needles are to be passed through the substance of the muscle from the upper and lower free border.

Fifth: Now completely sever the tendon just in front of the so-called muscle sutures.

Sixth: Dissect the tendon forward down to its insertion, and make a small groove underneath just at the scleral insertion, in order to receive the muscle end when the same is brought forward. Vivify the under surface of the tendon with a blunt curette.

Seventh: Now pass each of these two muscle sutures at about corresponding points from underneath the tendon at its insertion, from below upward and outward, at the same time through the re-approximated conjunctiva. Now pull the muscle forward, while rotating the eyeball toward the same. Firmly tie the sutures above the conjunctiva.

Eighth: Gently vivify the upper surface of the muscle to an extent corresponding to the length of the severed tendon. Lap the tendon back over the muscle and firmly fix the distal end by means of two sutures, one above and one below, to the body of the muscle. While doing this, have the eyeball turned in the opposite direction so as to have the parts on a slight stretch. Use cat-gut sutures here.

Ninth: Replace the conjunctiva and close the wound with one or two sutures, as the case may indicate.

Tenth: Apply a cold aseptic bandage for six or eight hours. The other after treatment is the same as in any of the operations.

Eleventh: Remove the conjunctival sutures on the sixth or seventh day, or earlier if firm union has taken place.

The operation has the following points which commend it for such cases as above alluded to:

1. It does not disturb the insertion of the tendon, therefore does not alter the relationship of this tendon to the others or its relation to the optic axis. It does not permit, therefore, of any rotary displacement of the globe.

2. It does not sacrifice any tendon substance.
3. It better maintains the proportion of muscle and tendon.
4. There is very little chance for the giving way of the sutures, which is an important feature.
5. The original lever power of the muscle is not interfered with.
6. The actual direction of muscle traction, and therefore its influence upon the position of the globe, is not disturbed. In other words, the anatomico-physiological traction of the muscle remains unaltered.
7. It does not cause any more reactionary disturbances or thickening of the conjunctiva than the ordinary advancement operation.
8. The maximum shortening attained is equal to the length of the tendon.
9. The result of the shortening is just as constant as in some of the other operations, if not more so.
10. A partial shortening may be obtained by placing these sutures at any distance in the substance of the tendon and proceeding as above described.

PAMPHLETS RECEIVED.

- “The Memorial Hospital.” 1903.
- “Ueber Conjunctivalcysten.” By G. Ischreyt, M.D.
- “Fifty Years: 1853-1903.” Queen & Co., Philadelphia.
- “Ueber Subconjunctivale Extraction.” By W. Czermak, M.D.
- “Subconjunctivale Extraction mit Bindehauttasche.” By W. Czermark, M.D.
- “Retinal Rosette Formation of Neuroglia in Inflammatory Processes.” By B. Pusey, M.D.
- “Beitraege zur Pathologischen Anatomie der Thraenenorgane.” By G. Ischreyt, M.D.
- “The So-called Mydriatics: their Actions, their Uses and their Dangers in Ophthalmology.” By Ch. A. Oliver, M.D.
- Experiments to Determine the Value of Formalin in Infected Wounds of the Eye.” By J. H. Claiborne, M.D. and E. C. Coburn, M.D.

AN EXPERIENCE WITH THE SIDEROSCOPE.

BY ARTHUR E. EWING, M.D.,

ST. LOUIS, MO.

VERY soon after receiving the instrument in question, an excellent opportunity to try its power upon a fragment of steel offered itself. The fragment had entered the lower portion of the cornea, passed through the lower margin of the pupil, through the lens, and backward and outward through the globe, and had imbedded itself in the temporal portion of the sclera near the equator and a little above the horizontal meridian, where, after the swelling had subsided, it could easily be seen. When this eye was brought near to the magnet of the sideroscope there was no deflection until the foreign body would be within a distance of eight millimetres: with the magnet on the nasal side of the globe, or at the upper or lower surface there was no disturbance whatever. At six millimetres the movement was positive. The size of the fragment when it had been removed was found to be $1 \times 2 \times 3.5$ millimetres. Since this trial was made there have been several instances where pieces of iron or steel of about this size have entered the globe and have been removed, and each showed that the instrument could be depended upon at distances of from five to six millimetres. The case to be described is interesting because there was no deflection at first, although the greatest care was exercised to have everything in proper order, and a few days later the deflection was very positive.

The patient was first seen forty-eight hours after the injury. Near the center of the cornea there was a clean perforating wound four millimetres in length, and back of this a similar wound in the anterior capsule of the lens. The lens was opaque and the swollen cortical substance was pushing forward through the wound in the capsule. The anterior chamber was shallow: the pupil was five millimetres in diameter, probably from a mydriatic which had been used, and irregular at its lower temporal margin: and there was moderate circumcorneal injection. Because of pain the patient had obtained very little sleep. Repeated trials with a 500-volt magnet gave negative results. Immediately following this, many careful

trials in every position were made with the sideroscope, also with negative results.

The next day the pupil was found to be widely dilated, atropine having been used regularly at intervals of every four hours: the anterior chamber was deeper and clearer: there was less circumcorneal injection and no pain. Although these conditions continued, four days later the patient consented that a radiograph be taken. The exposure was made directly through the head, from side to side, the temple of the injured eye having been placed against the sensitized plate. The result showed a foreign body within the eye a little anterior to the equator.

Another antero-posterior exposure was determined upon for the following day, it being thought best that there should be a twenty-four-hour interval. In the meanwhile another trial was made with the sideroscope, and it was found that there was always marked deflection when the region about the temporal margin of the tendon of the inferior rectus muscle was approached. The second radiograph, with the exposure at right angles to the first, confirmed the result by the sideroscope. Another trial was then made with the large magnet with the hope of bringing the foreign body forward into the anterior chamber through the already softened lens. The only effect, however, was at times a slight "pulling" sensation to the patient. Following this the sideroscope showed that the position of the fragment had not been changed.

An incision about four millimetres in length was made through the sclera at the temporal border of the tendon of the inferior rectus muscle with the point of a rather broad Graefe knife. Then by means of a small fifty-volt magnet armed with a wedge-shaped tip, somewhat rounded at the edges—which enters a wound readily and has proved to be the form with the greatest power—a scale of metal $0.5 \times 2.5 \times 4$ millimetres in size was removed. The conjunctival wound was closed with a suture. Healing progressed favorably; the lens has absorbed, and with proper correction of the refraction $V = \frac{20}{48.5}$.

The explanation for the negative result with the sideroscope in the examination first made must be that the foreign body was in a firm clot of blood, or in a mass of exudate, and

beyond the field of the magnet. After the lapse of a few days this clot or exudate had become to some extent absorbed and the foreign body had been brought nearer the surface and within the field. As this is the second occurrence of this kind that has come under my observation, my conclusion is that when a Roentgen ray picture cannot be obtained, a single examination with the sideroscope, if negative, should not be relied upon, but that at intervals of a few days there should be several successive examinations.

BOOK REVIEWS.

THE COMMONER DISEASES OF THE EYE: HOW TO DETECT AND HOW TO TREAT THEM. By CASEY A. WOOD, M.D., and T. A. WOODRUFF, M.D. 250 illustrations and 7 colored plates. Chicago, 1904: G. P. Engelhard & Co. Price \$1.75.

A clear and thoroughly safe guide for the student of medicine. The book is free from unnecessary intricacies and gives what a general practitioner should know about eye diseases and their treatment. Print and illustrations are good.

THE RELATION OF THE CERVICAL SYMPATHETIC TO THE EYE. Papers read before the section on Ophthalmology of the American Medical Association at the annual session, New Orleans, May, 1903. Chicago: Press of the American Medical Association. 1904.

A review of what is thus far known concerning the influence of the sympathetic on the eye in health and disease, including the effect of excision of the cervical ganglia on intra-ocular pressure.

THE WORTH OF WORDS. By DR. R. H. BELL. Hinds & Noble, New York.

Well worth studying, particularly the chapter on everyday errors of which too many occur in modern literature on medical subjects.

ALT.

MEDICAL SOCIETIES.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.*

Clinical Meeting, March 10th, 1904.

SIR ANDERSON CRITCHETT, F.R.C.S.E., V.-Pres., in the Chair.

MR. J. R. LUNN showed an elderly man with compression in the retinal veins by thickened arteries in one eye, the vessels in the other eye showing also some degeneration. A large area above the macular region was occupied by a hæmorrhage. Owing to the serious view of such cases taken by Mr. Gunn, he proposed to bleed the patient, while Mr. Nettle-ship had suggested purging him as well. Mr. Gunn said that although he looked upon such cases as grave, yet that as in this case there was no albuminuria he thought it rather a favorable one.

DR. H. GRIMSDALE exhibited a man aged 24, who had suffered from gonorrhœal ophthalmia a year ago, resulting in dense leucoma in one eye. When light was allowed to shine on the good eye the pupil contracted, while the other eye rotated distinctly upwards; and when light was withdrawn the reverse took place, the affected eye rotating downwards. This condition had been previously noticed after head injuries, but had not before been described as occurring in such a case as the present one.

MR. H. L. EASON showed a case of what he took to be a persistent hyaloid artery. The right eye had defective vision and nystagmus. The vessels were seen emerging from the lower border of the disc, one branch running forwards and opening in a funnel-shaped aperture against the ciliary body below the iris. Should it be considered as an inflammatory condition or as a developmental condition, namely, a persistent hyaloid artery? Mr. Treacher Collins saw no reason for doubting that it was really a persistent hyaloid artery, and that, in addition, there had been atypical development of the vitreous.

* British Medical Journal.

MR. EASON also showed a patient with albuminuric retinitis, who, three years before, had acute nephritis, anasarca, and detachment of both retinae. His general condition had greatly improved and the detachment in both eyes had subsided.

MR. CLAUD WORTH showed a member of a family in which congenital dislocation of the lens was present in five generations. Twenty-four years before Mr. Stanford Morton had described the family in a paper in the *Royal London Ophthalmic Hospital Reports*, and since then two more members had been born, both with the same condition. The Chairman thought that such a series of cases was most important as bearing on the subject of heredity. Mr. Nettleship thought that possibly a slight luxation of the lens in young children might account for the high degrees of myopia which were occasionally seen and which did not get worse as time went on.

MR. A. H. THOMPSON showed a girl, aged 10, who had a congenital coloboma of the iris downwards in one eye. Near the periphery of the fundus and well below the macula was a white patch with indefinite edges and a band of healthy choroid crossing it. In view of the condition of the iris he took it for a coloboma, otherwise he would have been inclined to regard it as a patch of choroidal atrophy. The vision was $\frac{6}{18}$, and the left eye was normal.

MR. BISHOP HARMAN showed a child, aged 5 years, with the following abnormalities: The anterior fontanelle was not closed; a coloboma of each upper lid; a coloboma of the iris and choroid on one side; two dermoids of the globe on the right side; very tortuous retinal vessels; an imperfect mouth; a depression over the sacrum representing the tail (fovea sacralis); two ears on the right side and four on the left. The child was unable to walk or say more than a few words.

MR. A. H. BENNETT showed a girl, aged 9 years, who when first seen in October, 1903, had keratitis punctata in the right eye: she was not again seen until she attended as an out-patient under the care of Mr. Claud Worth at the West Ham Hospital on February 18th last. The right eye had been red for a month, and the sight had failed without pain. With this eye she could only see hand movements; the vision

of the left was $\frac{6}{9}$. The right eye was inflamed with gross oily-looking patches of keratitis punctata. The iris was yellowish and the pupil was clouded. There were five tuberculous-looking masses growing near the angle of the anterior chamber, varying from the size of a shriveled barley-corn to that of a No. 6 shot. These appeared to be fluffy as though covered with exudation. The eyeball was not tender and there was no fundus reflex. The left eye was normal except for slight ciliary redness. Atropine was applied and hyd. c. creta and syr. ferri phosph. co. were given internally. Two weeks later the exudate had mostly disappeared, and small bloodvessels were seen on the surfaces of the growths. The left eye now showed typical pyramidal keratitis punctata; the vision remained the same; the lungs were healthy, but the cervical glands were enlarged. The family history disclosed nothing either specific or tuberculous.

MR. R. MARCUS GUNN showed a drawing of an eye with mal-development of the suspensory ligament. The patient complained of symptoms suggestive of a refractive error, but after the use of atropine the upper edge of the lens, instead of being convex, was roughly speaking horizontal. At two or three places some fibres of the suspensory ligament came down and were attached to it, thus giving rise to elevations along this edge; there was also a coloboma of the lens downwards.

DISCUSSION ON GLAUCOMA.

WILLS HOSPITAL OPHTHALMIC SOCIETY.

A Stated Meeting, March 14th, 1904.

The Chairman, DR. WILLIAM ZENTMAYER, announced that there would be an informal discussion upon glaucoma.

DR. FRANK FISHER, in order to open the subject, cited the histories of two diametrically opposed types of such cases which had recently come under his observation. He desired to know under what conditions an iridectomy should be performed; when should enucleation of a glaucomatous blind eye be done; and if enucleation be done, what effect would the procedure have upon the fellow eye. He was uncertain

as to the character of the visual fields serving as a guide to the value of an iridectomy, they being so unstable and uncertain. His experience had led him to ignore the usefulness of the degree or the grade of visual acuity as offering itself as a therapeutic guide. In some eyes which had become blinded from glaucoma processes, he had found that eserine failed to produce pupillary contraction. He had been interested in studying a series of cases of glaucoma, in which there had not been any consanguineous marriages. He gave the detailed history of one such family, and had more or less knowledge of some others. He inquired what had been the experience of members of the society in regard to the ophthalmoscopic appearances of the eye ground and media after the performance of posterior sclerotomy. He asked this question as he had seen two cases in which he could locate the position of the internal traumatism by a localized rupture of the choroid. He would like to know the most tenable theory for the more or less reduction of intraocular tension in cases in which posterior sclerotomy had been done. He asked the question whether the vitreous elements were reformed or not. He would like to know if any members of the society had, like himself, seen recession of optic nerve head cupping after successful iridectomy.

THE CHAIRMAN stated that he enucleated the offending eye in absolute glaucoma, with a possible previous attempt at iridectomy. He performed an iridectomy if possible, in acute inflammatory glaucoma. His studies with the visual fields in chronic glaucoma had taught him that the character of decreases and the peculiarities of lessened areas were not in any way characteristic or typical.

DR. CONRAD BERENS believed that enucleation tended towards the conservation of the energies of the other eye, his experience being that vision and intraocular tension of the remaining eye are preserved for much longer periods of time. His experience had taught him that the earlier an enucleation is done—particularly in a painful eye—the safer it is for the other one. If possible, he preferred an early iridectomy in all appropriate cases. In some cases of systemic type he eschewed all forms of operative procedure and preferred to wait for some acute condition necessitating radical

measures, watching and guarding over the general system and directing his main therapy towards the general dyscrasia at hand. He had found good results from the ingestion of large doses of iodide of potassium in association with the salicylates. He had found that the more he had to deal with the condition, the more he depended upon remedial measures, reserving as a rule operative interference for cases of the fulminating type. He had observed the effects of climate upon such cases, and spoke of the effects of psychological processes upon the condition of the patient. He mentioned his experiences with the results he had obtained in some of his chronic cases by the employment of varying strengths of synoidal currents.

DR. MCCLUNEY RADCLIFFE showed a case under his care in the hospital in which by enucleation of the blind eye, in combination with appropriate local and general treatment, the ordinarily seen progressive and disastrous symptoms, he felt sure, were rapidly and painlessly disappearing in the fellow eye.

DR. CHARLES A. OLIVER said that no fast and hard law could be laid down in any particular case; each one, and even the same case at different times, demanding what might be aptly termed "symptomatic treatment." After a large experience with various operative measures, in association with carefully graded local and general therapy, and above all, hygiene with well regulated, cheerful surroundings, and early treatment directed towards the removal of any possible offending dyscrasia, he had in many cases ceased to be disturbed as to the probability of ultimate failure; in other words, he made it an unalterable rule to exercise constant vigilance against the general and special inroads of any causative factor with the prompt removal of the disturbing local conditions in the easiest and most comfortable way possible in each case. Whenever possible, he enucleated an eye which had become blinded from glaucoma, as he had learned from experience that it was the safest and the most certain of all of the radical procedures, in certain types of cases, for the fellow eye; in fact, he was certain that it undoubtedly seemed to have a beneficial influence upon the fellow organ, whether it was injured or not. The question of the performance of

an iridectomy he reserved to cases in all stages, more particularly the incipient and practically unadvanced ones in which he felt that there was either a present necessity or an advantage in the future to be gained by opening as much as possible of an imperfectly acting filtration angle. In some cases of coarse severity, he repeated the iridectomy and even had successfully and usefully removed the crystalline lens. He uniformly reserved his operative procedures to the individual organ in question. He spoke of having seen some cases in the hands of some of his colleagues apparently do well by the employment of cyclotomy, and believed that the measure, if not too disturbing in its immediate traumatism, possibly did good by destruction of some of the lymph-making glands. He asserted his disbelief in a proper regeneration of the vitreal elements, believing the vitreous to be like the crystalline lens, an organized body, which once removed or destroyed was replaced with ordinary lymph; in consequence, he doubted the efficacy of all procedures in which loss of the vitreous body constituted a part. He denounced the term "liquid" or "fluid vitreous," and said that the replacement of the vitreous humor by ordinary lymph in which there were loose vitreal elements with uveal debris, merely tended to provoke glandular action with consequent increase of the intraocular fluids. He spoke of the classical experiments of Uribe Troncoso upon the effects of altitude upon the density of the intraocular fluids, as well as the morphological conditions of the fluids themselves. As one of the results of a return of intraocular pressure to normal, he had more than once seen temporary lessening and even disappearance of shallow pathological cuppings in the optic nerve head, particularly in the temporally placed finer fibres.

DR. S. LEWIS ZIEGLER spoke of the advantages and the good results he had personally obtained in certain varieties of cases by the performance of posterior sclerotomy. He made the procedure by a quick plunge with a von Graefe knife with its back directed towards the ciliary body some 6 or 8 millimetres back of the ciliary region, between the muscular attachments and parallel with the radiating vessels. He rotated the knife at right angles to the first incision, allowed a few beads of vitreous to escape, and withdrew the instru-

ment, thus making a T incision. He had found that there is immediate hypotension, and there is never any reaction. His experiences had coincided closely with those given by Dr. Oliver. In the blind eyes of some such types he had had useful recourse to optico-ciliary neurotomy, having, he remembers in more than one instance, kept a functionless eyeball intact and free from pain and harmful influences for a period of nine years. He mentioned several interesting examples of the various conditions, showing the multiplicity and variability of the symptom-complex in cases which had come under his immediate observation, distinctly proving the efficacy of certain procedures in some cases and the inefficiencies of many authoritative measures that had been strictly applied, in others. The more extended his experience had become in such an enormous mass of material as was almost daily given him in such a large service as in the outpatient department of the hospital, the broader and more conservative had become his views in regard to therapeutic measures. He was daily waiting for opportunity, and was more than willing to apply any plan of therapy which offered in the least a greater chance for the patient's welfare. Upon being asked whether he would do an iridectomy at the time of the appearance of the earlier signs and symptoms of the disease, he answered that he would in appropriate cases. He had never had any bad intraocular complications of inflammatory type to arise after the performance of posterior sclerotomy. In a number of painful cases in which immediate operative procedure could not be done, he had most useful recourse to a formula containing hyosine hydrobromide, morphine, strychnine and pilocarpine; a combination which not only subdued pain, but which both stimulated and controlled lymph circulation. In support of his claim for the value of these therapeutic agents, he cited three most interesting confirmative cases which he had seen at the hospital several years previously. In the use of electricity he had had considerable experience, finding a most curious paradoxical result that pain and tension are reduced when the negative electrode is applied to the eyeball. In his hands, pneumomassage had given but moderate effects in some cases of chronic glaucoma.

ABSTRACTS FROM MEDICAL LITERATURE.

BY W. A. SHOEMAKER, M.D.

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THE OCULAR COMPLICATIONS OF BRIGHT'S DISEASE.

L. Strickler, (*Journal Am. Med. Ass.*, Feb. 20) after discussing the subject and giving the histories of several cases illustrated with diagrams of the retinal findings, draws the following general conclusions:

(1) There are no ocular complications of Bright's disease from which, independently, a positive diagnosis of Bright's disease can be made. They should direct our attention to the probability of Bright's disease and lead to systemic examination.

(2) The prevalent idea that one must find the characteristic picture of Bright's disease with hemorrhages and areas of degeneration and white splashes in the region of the macula, is a mistaken one, since one may meet with any of the many manifestations of vascular or retinal inflammation due to the action of toxins.

(3) Only a small percentage of the cases of Bright's disease develops ocular complications, but if larger numbers of cases were systematically examined it is more than probable that a much larger percentage would be found to have ocular lesions, which have not caused functional disturbances, and consequently have been overlooked.

(4) All the ocular complications of the disease are the result of altered nutrition, or toxæmia; in other words, a chronic uræmia.

(5) Diseases of the eye coming on in the course of Bright's disease are of the most serious prognostic import, and indicate an early dissolution of the patient.

(6) In the acute form conditions are of a more hopeful character, though a prolonged siege, with inability to stay ocular disease, cannot fail to leave the patient, though he recovers, with greatly impaired vision.

(7) An estimation of the quantity of urea made from a

total amount of the urine of twenty-four hours, under proper diet, is the barometer by which we are to be guided in determining the early or immediate fatal outcome of the case.

(8) In the Bright's disease of pregnancy, with ocular involvement, a low urea quantity should be a positive sign for immediate interference, and should justify artificial abortion both to save the eyesight as well as the life of the mother.

(9) In cases of Bright's disease disclosing choroidal and retinal changes, he has found the urea quantity in the urine below the normal; and it seems more than probable that the urea or other excrementitious substances retained in the blood, due to faulty kidney excretion, acting as chemical irritants or toxins, are directly responsible for the inflammatory or degenerative changes.

THE DEVELOPMENT AND SIGNIFICANCE OF THE VITREOUS.

Clarence Loeb (*St. Louis Medical Review*, March 12th) summarizes A. Koelliker's investigations and views on the vitreous as follows:

A. VITREOUS.

The vitreous is chiefly an ectodermal structure, which, however, during its development, contains mesodermic constituents. It is divisible into two parts.

I. Ectodermic or Retinal Vitreous.

This vitreous arises entirely from the retina, and consists of two parts.

(1) The retinal vitreous, in the restricted sense, or the primitive vitreous.

(a) This arises from the entire external surface of the external layer of the primary optic vesicle, and the distal layer of the secondary optic vesicle. It fills the entire space between the retina (i. e. the pars optica) and the lens, and consists of protoplasmic processes of numerous cells of the embryonal retina whose delicate projections form a dense mesh-work.

(b) Gradually these processes disappear in the depth of the eye, but persist for a long time at the point of transition of the secondary vesicle. When they have vanished, the *limitans interna* develops by the fusing of the broadened ends

of the vitreal developmental cells, and at the same time the differentiation of the retina appears.

(2) The Ciliary or Permanent Vitreous.

(a) As the pars ceca or ciliaries, retina develops its cells give rise to vitreal fibres. A part of these follow the meridional course of the pars optica retinae and mix with the retinal vitreal fibrillae, and a part line the fossa patellaris. The origin of these fibres begins exactly at the ora serrata and ends where the zonula fibres commence, about 1.0 mm. in front of the ora.

(b) As the eye grows older, the ciliary vitreal fibres increase in number, and finally form the mature vitreous, whose growth, as well as the formation of the vitelline humor, is chiefly due to the vessels of the corpus ciliare.

(c) All retinal and ciliary fibres are to be regarded as protoplasmic processes of the supporting, or Mueller's, cells of the retina. They are comparable to the neuroglial mesh-work of the surface of the central nervous system.

(d) There is no membrana hyaloidea. The ciliary vitreous in places shows denser layers, thus forming the lamina posterior, along the pars optica retinae; the lamina anterior in the fossa patellaris; and the lamina medialis, as the lining of the funnel formed by the arteria capsularis.

II. Mesodermic Vitreous.

(a) This is found in all animals, into whose embryonal eyes a blood vessel enters, and is formed by the vessel-tree of the arteria hyaloidea and by the stellate connective tissue cells accompanying it.

(b) When there is only an arteria capsularis present, there is a clear demarcation between mesodermal and retinal vitreous. When, however, there are vasa hyaloidea propria present, the vitreous throughout consists of mixed mesodermal and retinal elements.

(c) Whether or not mesoderm is carried into the eye during the development of the lens, has not entirely been determined. It is certain, however, that the external mesoderm is in communication with the internal through the isthmus, between the border of the secondary optic vesicle, and the lens.

(d) Inasmuch as the vitreal and lenticular vessels later

disappear, we can no longer speak of a mesodermal vitreous in a developed eye. The mature vitreous is to be regarded as essentially of ectodermal, i. e. retinal formation.

III. A lenticular vitreous (v. Lenhossek) does not exist.

B. ZONULA.

(a) The zonula fibres develops identically like the fibres of the vitreous, viz., as protoplasmic processes of the cells of the pars ciliaris retinae.

(b) There is no sharp dividing line between zonular fibres and ciliary vitreal fibres. They mix at the place of transition, and some zonular fibres run into the vitreous.

(c) Therefore, zonular and vitreal fibres are of similar origin, although the fibres of the two differ from one another in chemical composition.

THE RETINAL SYMPTOMS OF VASCULAR DEGENERATION.

L. A. W. Alleman (*American Medicine*, Feb. 20th) believes that it is but reasonable that if functional alterations precede organic changes in the circulatory system, they should be discoverable in the eye, where alone in the economy it is possible to inspect a vessel without interfering with its function. The physical condition which gives rise to the first evidence of disturbed nutrition, visible in the fundus oculi, is a high peripheral tension dependent upon or associated with improper elimination. There are no constant general symptoms characteristic of slight nutritive disturbances. In many cases the patients believe themselves to be in the best of health. But there is usually a history of overwork or worry at a time shortly preceding the examination, or of intemperance in food, over-stimulation, or a neglect of reasonable physical exercise. The writer considers four groups of cases: In the first group no organic lesion is discoverable with the ophthalmoscope. The important finding is a tortuosity of the smaller retinal vessels and of their terminal twigs. In the second group of cases, a similar condition of the fundus is found, but in addition more or less bending of the vessels at the crossings is present. In many cases a change in the caliber of the retinal vessels is observable. Another retinal symptom is a momentary decrease in the force of the retinal

circulation. In the third group of cases, some evidence of organic change in the vascular walls can be made out. In the fourth class, the cases presenting advanced vascular disease are included. The one constant abnormality which the writer has always found in association with the retinal symptoms which he has considered, is some disturbance in the elimination. In a large majority of cases this is evidenced on urinary examination by a diminution in the elimination of urea. —*Med. Record*, Feb. 27.

A CASE OF CHOROIDAL INFLAMMATION WITH PERMANENT
LOSS OF VISION. CAUSED BY EXCESSIVE USE OF THE EYES
DURING A COMPARATIVELY SHORT PERIOD OF TIME.

D. B. St. John Roosa (*Medical Record*, Feb. 20) records a case in which a physician read rather small type almost continuously for about ten hours. The following day he noticed that his vision, which previously had always been good, seemed blurred. Six weeks later he consulted the author, when it was found that his vision with right eye was $\frac{20}{30}$ and the vitreous so hazy that no good view of the fundus could be obtained. Vision with left eye was $\frac{20}{20}$. Treatment was prescribed, but the case was not seen again until fifteen months later. Then the vitreous had cleared up and several spots of choroidal atrophy were found in the right eye. Vision with right eye was still $\frac{20}{30}$, and with left eye $\frac{20}{20}$. Six years later the patient came for reading glasses. At this time the same choroidal changes were found in the right eye, and the vision was still $\frac{20}{30}$. The left fundus oculi appeared normal and the vision in the left eye at this time was $\frac{20}{15}$.

HÆMORRHAGE IN THE RETINA IN PERNICIOUS ANÆMIAS.

Tchemolossoff (*Roussky Vrach*, Nov. 29, 1903) discusses a case of ankylostomiasis, with its pernicious anæmia, in which there were hæmorrhages into the retina. Such cases are rare, although hæmorrhages of this kind have been described as occurring in the essential form of progressive pernicious anæmia. He thinks that such hæmorrhages constitute a constant symptom in severe forms of anæmia due to ankylostoma, though the patients may not complain of their eyes. They appeared in this case in the form of round spots, bands and semilunar marks, and are chiefly found in

the posterior pole of the eye. Their presence influence the prognosis. They take place by diapedesis, are absorbed without leaving any traces, and do not give rise to any inflammatory symptoms. They occur chiefly in the layer of nerve fibres, but may penetrate to the outer layers of the retina, even to the external limiting membrane. The changes in the smaller vessels of the retina in these cases consist in swelling of the nuclei of the endothelial cells. The hæmorrhages resembles in every particular those met with in the essential pernicious anæmias. The diagnosis is made chiefly from the appearance of the patient, the presence of ankylostoma in the fæces, and the absence of any disease, such as purpura hæmorrhagica.

TREATMENT OF GONORRHOEAL OPHTHALMIA.

G. Hirsch (*Münchener Med. Wochenschrift*) reports the prompt cure of a case of gonorrhœal ophthalmia, by the sub-conjunctival injection of a 1-500 solution of hydrargyrum oxycyanate to which a little acoin had been added. The injections caused considerable irritative reaction. The first arrested the progress of the disease; three days later another was given which completed the cure.

PERIODIC OPHTHALMOPLLEGIC HEMICRANIA.

Carlo Molon (*Gazzetta Degli Ospedali e Della Cliniche*, Dec. 27, 1903) describes a case of this rare disease, which was defined by Charcot as a paralysis of one of the oculomotor nerves accompanied by hemicrania which tends to occur in repeated attacks. The origin of this syndrome is not definitely known. Charcot considered it of functional origin, while others have asserted that it is connected with a central lesion in the nucleus of the oculomotor, and still others maintain that it is due to a peripheral change in this nerve. The patient in the present case was a man, aged thirty-seven years, who for six years had been suffering from periodical attacks of hemicrania on the left side occurring irregularly about every two months. At first these attacks were simple migraines, usually associated with dietetic disturbances and preceded by nausea, vomiting, etc. Later, the patient found that the left eye could not be lifted during the attacks, and

on examination the left pupil was found to be wider than the right, the eye rotated externally, and there was a certain amount of exophthalmos, as well as crossed diplopia. These paralytic symptoms were at first transitory, but in the course of time became permanent. Ophthalmoscopic examination showed, during the attacks, hyperæmia and hæmorrhages in the left retina. The author is inclined to believe that the condition is a purely functional one and due to circulatory disturbances in the oculomotor system.—*N. Y. Med.*, Feb. 20.

THE MODERN TREATMENT OF DACRYOCYSTITIS.

Alfred Wiener (*Medical Record*, April 2) divides cases of dacryocystitis into three groups: (1) Those that can be cured by massage and syringing. (2) Those in which there is an organic stricture, but which may be cured by removing the anterior end of the inferior turbinate and laying bare the membranous canal of the nasal duct. (3) The cases that will not yield to either of the treatments just described. These last cases call for extirpation. The indications for this operation are: (1) The fistula of the lacrimal sac after long continued suppuration (acute cases excepted). (2) In chronic blennorrhœa of the sac, with or without ectasia. (3) In chronic catarrh of the sac with an organic stricture. (4) In chronic blennorrhœa when disease of the bone with caries is present. (5) In relatively fresh cases of blennorrhœa, under the following conditions: (a) In *ulcus serpens* when the healing is very much favored by an immediate extirpation of the sac; (b) when an operation for cataract or glaucoma is contemplated; (c) in fresh injuries of the cornea. (6) Tuberculosis of the sac. A typical method for performing extirpation is described in detail.

NON-OPERATIVE RELIEF OF EYESTRAIN FOR THE POSSIBLE CURE OF EPILEPSY, AS TESTED IN 68 CASES AT THE CRAIG COLONY.

William H. Spratling, (*American Medicine*, April 9) the medical superintendent at the Craig Colony of Epileptics, gives in detail the results which followed the attempts made by Gould and Bennett to cure 68 epileptics by fitting them with proper glasses. He says:

“Personally, I deeply regret that the experiment so care-

fully and scientifically made by Dr. Gould and Dr. Bennett did not yield better results. At the same time, it strengthened my convictions that epilepsy is not a 'single prescription disease,' so to speak—that the correction of the abnormalities of the eye alone is not any more likely to cure it than are surgical measures directed against the brain, from which so much was at one time hoped for, but from which we now expect so little." Gould in an addendum to Spratling's paper gives his views of the experiment as follows: "Two mistakes were made in conducting the experiment: 1. Young patients, and those only with less injured nervous systems, should have been chosen. 2. Resident or frequently visiting opticians and oculists should have been insured to make the retestings, readjustments, etc., most necessary. Despite these faults, together with incomplete statistics, etc., 19 out of 57 patients, for the only comparable terms given of three months, showed a reduction of the number of seizures of 382 (44 per cent.), and 1 in 57 was cured against 1 in 81 by all other methods of treatment that have been tried at the Colony. From the results of the experiment at Craig Colony I judge that the permanent residence at such institutions of an expert ophthalmologist would result in great monetary saving on the part of the State. Spectacles would certainly lessen the special disease, and the number of seizures. Even if they would not do so they would tremendously lessen headache, digestive troubles, etc. For mere humanity's sake they should be ordered. The habit of depreciation and ignoring the eyestrain factor is both cruel and unscientific."

EYESTRAIN CONSIDERED AS A FACTOR IN PRODUCTION OF
LATERAL CURVATURE OF SPINE. (PRELIMINARY
COMMUNICATION).

Henry W. Kilburn (*Boston Medical and Surgical Journal*, March 24) has observed a number of cases in which he believes that eyestrain played an important part in bringing about lateral curvature of the spine. Three such cases are reported in detail. He believes that the relationship between eyestrain and lateral curvature is a subject that deserves careful investigation.

BOOK REVIEWS.

TRAITÉ DES TUMEURS DE L'OEIL, DE L'ORBITE ET DES ANNEXES. (Treatise on the tumors of the eye, the orbit and their annexes.) By DR. FELIX LAGRANGE. Second volume Tumors of the Orbit and Annexes. With 218 figures in the text and 12 plates. Paris: G. Steinheil. 1904.

Not enough praise can be bestowed on this magnificent work, so full of original observations and beautiful illustrations. Almost all the literature on the subjects treated has been made use of in deriving final conclusions, which entailed an enormous labor. The author and the publishers are to be congratulated on the issue of such a monumental work. No oculist can afford to be without it.

SUBJECTIVE SENSATIONS OF SIGHT AND SOUND, ABIOTROPHY AND OTHER LECTURES. By W. D. GOWERS, M.D. Philadelphia, 1904: P. Blackiston, Son & Co.

This volume forms one of a series of lectures on nervous diseases. It is a collection of lectures delivered and published by Gowers, but which are now revised or rewritten. Whatever comes from the distinguished author's pen is sure to be full of interest, and these lectures make no exception. Oculists will be especially interested in the articles on subjective visual sensations, and on myasthenia and ophthalmoplegia.

THE MAN WHO PLEASES AND THE WOMAN WHO CHARMS. By J. A. CONE. Hinds & Noble, New York.

Very pleasant reading on good manners.

THE EYE: ITS REFRACTION AND DISEASES. Vol. I. The Refraction and Functional Testing of the Eye, complete in itself, in twenty-eight chapters, with numerous explanatory cuts and diagrams. By EDWARD E. GIBBONS, M.D., Assistant Surgeon of the Presbyterian Eye, Ear and Throat Hospital, etc., Baltimore. New York: The Macmillan Company. London: Macmillan & Co. 1904. \$5. 472 large 8vo pages, excellent paper. ALT.

There is much disappointment on opening this very attractive looking volume to see at the beginning an assertion so inaccurate as that the sun is the "source of all light." A few pages further on in the book we read: "The velocity of the red rays is the greatest; therefore they are retarded the least in passing through the dioptric medium," etc. The conclusion here expressed could not be logically deduced even if the premise were established, which is not, for it is the belief of physicists that all light would travel with the same velocity except when retarded by some dense substance. These are a few instances among many of a class of inaccuracies found throughout the book, which, though perhaps not of very serious import, indicate a lack of proper care in the preparation of the work.

But there is one error which, in justice to the students who will look to this book for guidance, ought not to pass without criticism. This occurs in the discussion of cylindrical refraction, the description of which is given on pages 41 to 43, is entirely erroneous and indicates an entire misconception of the whole question. The diagram on page 43, illustrating the focus for rays entering a cylindrical lens in an oblique meridian, is truly astonishing, for every ophthalmologist should know that no two homocentric rays lying in an oblique meridian of a cylindrical lens can ever be reunited in a focus as the result of refraction by that lens. Similarly the diagram and description of asymmetrical refraction as given on page 246 are erroneous. The discussion of hyperopia, myopia and astigmatism fail lamentably in fullness for a work that claims, as this one does, to be complete. The illustrations of the appearance of the pupil in skiascopy by no means convey a correct impression to one who is unfamiliar with the phenomena of that test.

In spite, however, of the defects which have been mentioned, the book contains much valuable information compiled from various sources, with nothing that is claimed as original. It covers nearly the same ground as Tscherning's *Physiologic Optics*, but it does not reach in merit that carefully prepared work.

W. N. SUTER.

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ORIGINAL ARTICLES.

BULLOUS KERATITIS: FATTY DEGENERATION OF BOWMAN'S MEMBRANE.

By ARTHUR E. EWING, M.D.,

ST. LOUIS, MO.

IN 1855, Albrecht von Graefe described an investigation which he made of the pathological changes that take place in the tissues in bullous keratitis. He found that the anterior wall of the bulla was constructed of the epithelial layer, Bowman's membrane and a thin layer of corneal fibers, the vesicle having been formed between the lamellæ of the substantia propria. There were also changes in the epithelium, the cell layers having increased in number, large multi-nuclear cells were present, and in places there were concentric arrangements of the cells similar to those which exist in epithelioma. Neither Schweigger, in 1873, nor Saemisch, in 1876, were able to confirm his observations with regard to the location of the vesicle, both finding that the anterior wall was an epithelial structure, and that the exudate was in front of Bowman's membrane.

In 1878, Leber went very minutely into the changes which occur in the cells and in the intercellular spaces, discovering cloudiness of the cell protoplasm, inability of the nuclei to readily absorb stains, vacuoles about the nuclei, irregular, branching dilatations of the intercellular canals which seemed to follow the nerve terminals

after they had passed through Bowman's membrane, and often a non-vascular fibrous layer between the epithelium and Bowman's membrane. In 1881, Fuchs pointed out that the œdema of the cornea in glaucomatous eyes was more marked in the anterior layers, as shown by the spaces being wider between the anterior than between the posterior lamellæ: also that the nerve channels which perforate Bowman's membrane were enlarged, and often between the epithelial layer and Bowman's membrane a narrow structureless band existed, which seemed to be coagulated transudate. From these conditions he inferred that the intraocular pressure forced the aqueous through Descemet's membrane into the corneal layers and the corneal fluids by way of the widened nerve channels in Bowman's membrane to the epithelium, thus separating the epithelium from its base and producing a vesicle.

The investigations of Birnbacher and Czermak in 1886, led them to believe that the bulla was a trophic disturbance resulting from diseased nerves or nerve terminals in the epithelium: into this diseased and weakened area the already existing œdema would rapidly force its superabundant fluid. In the same year, also, Brugger, from his researches, advanced the opinion that the œdema of the cornea caused inflammation in the epithelium with such rapid cell production that the cells broke down for lack of support. At these diseased places Bowman's membrane became weakened and perforated, and through these perforations the pent-up corneal fluid had opportunity to pass and collect behind the epithelium. Hess, and also Nuel, in 1893, found changes in the epithelium which indicated that the œdema caused irritation in the middle epithelial layers by lymph stasis and alteration of the cell nutrition, and the cells becoming liquified formed lacunæ. In 1903 de Schwenitz and Shumway described two cases, in one of which were changes in the epithelium, a new membrane between the epithelium and Bowman's membrane, and widened nerve canals in Bowman's membrane; and in the other there were epithelial changes and distortion and irregularity in the corneal lamellæ.

To the observations made by the above investigators may be added an instance which has come to notice, and which

may aid in clearing up this very obscure subject. The eye from which the specimens were taken was first seen by Dr. Green in 1887, the patient having discovered that there was a falling off in his visual acuteness. The examination made at that time showed the vision to be $\frac{15}{96}$, for which defect the ophthalmoscope gave no explanation, and it could only be accounted for by an injury which the eye had sustained in 1881. Eight years later the patient returned to Dr. Post, having suffered a great deal of pain for about three months. Vision was entirely gone, the globe was hard, and in the anterior chamber were numerous cholesterin crystals. Enucleation was advised, but deferred by the patient, who still hoped that the eye might be saved. After another seven months of more or less suffering he returned and submitted to the operation, making the statement that the eye had been sore most of the time for eighteen months, and that frequently there had been an excessive watery discharge. At the time of the enucleation a small ragged non-infiltrated ulcer of the indolent type, 2.5 x 3 millimetres in diameter, had developed in the epithelium and extended from the center of the cornea downward. The cornea otherwise was clear, especially noticeable because of the patient having a blue iris. There was slight circumcorneal injection, the anterior chamber was shallow, the iris a little *bombé* and somewhat vascular and over its surface were numerous cholesterin crystals, pupil moderately dilated, and lens semi-transparent.

The specimen was immediately placed in a five per cent. formol solution. A few days later it was frozen and bisected vertically through the ulcer, and the one half preserved in glycerine. The other half was stained with a one-half per cent. osmic acid solution, hardened in alcohol, mounted in celloidin, and sections made from its central portion over the region of the ulcer. These sections showed an atrophied optic nerve, a disc deeply cupped, and a detached retina, in which the fibrous structure was predominant, there being only traces of the rods and cones, the cells of the nuclear layers being scattered, and the two layers often being merged into a single layer. Between the retina and the choroid was an albuminoid exudate in which were here and there groups of blood

corpuseles. The uveal tract was conspicuously atrophied, and at its periphery the iris was adherent to the cornea for a distance of from one to one and one half millimetres. The lens was normal in the central layers, the cortical layers were swollen, and here and there among them were wandering cells, and in the anterior portion to one side there was a development of fibrous tissue between the cortex and the anterior capsule. The iris was *bombé* and firmly united along its anterior surface with a membranous, slightly vascular net-work, which filled the pupil and the anterior chamber, uniting the iris, lens and cornea. In its upper and also in its lower third, Descemet's membrane was denuded of endothelium over extensive areas, while over the pupillary area the cells had increased to several layers; the membrane itself was intact, though in places it was very thin and intimately united with the membrane that filled the anterior chamber. The posterior layers of the cornea were about normal; among the central and anterior layers there were inter-lamellar spaces that were wider than normal. Bowman's membrane had been destroyed in several places, and filling each of these perforations, besides extending variable distances between the membrane and the epithelium, was a layer of thin fibrous tissue of varying width and sometimes vascular, upon which rested the basal cells of the epithelium. In an area of from three to four millimetres near its center, the membrane was undergoing fatty degeneration, as shown in the osmium stained sections. This degeneration was not to be detected in the sections from the half which had been preserved in glycerine and stained with alum-carmin and with hematoxylin. About the corneal margin there was a moderate accumulation of leucocytes in the conjunctival tissues. The epithelium was continuous over the surface of the cornea except for a space of about one half of a millimetre near its center (the whole area of the ulcer was divided into sections in order to confirm this point), but in many places it was thickened and elevated from Bowman's membrane in the manner indicated in the accompanying diagrams, which have been drawn upon photographs taken from the sections, and which are here produced as demonstrating different stages in the course of the disease. They indicate that the bullous keratitis attendant upon advanced

glaucoma is not primarily an affection of the epithelium, but a form of necrosis of the anterior limiting membrane, in the destruction of which the epithelium is forced to take part.

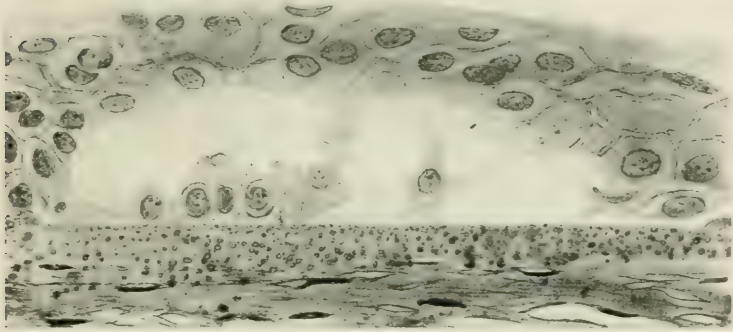


FIG. I. Incipient vesicle 0.2 mm. in length, at center of cornea: fatty degeneration of Bowman's membrane.

The probability that this is true is particularly well depicted in one of the sections (Fig. I), which shows an incipient vesicle in a region of cornea not heretofore attacked, as is evidenced by the cylindrical basal cells and the otherwise normal

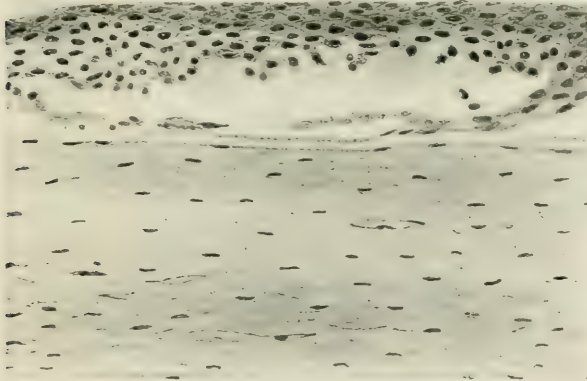


FIG. II. Incipient vesicle 0.6 mm. in length, in a previously affected region; partial fatty degeneration of Bowman's membrane. Located 1 mm. above center of cornea.

epithelium. Although of normal width, Bowman's membrane is rich in fatty vacuoles. Its surface is partly bare, partly covered with absorbing and degenerating basal cells which still cling to it. In two of these cells there are vacuoles

surrounding the nuclei. The next adjoining layer has also been involved in the absorption, and the intercellular spaces in the middle layers immediately bounding the vesicle are abnormally widened. In another section (Fig. II) the conditions are similar, but this is an incipient vesicle in a region that has probably suffered from a similar eruption, as shown by the spindle cells which lie next to Bowman's membrane, and by the enveloping epithelium being thickened and its cells being irregularly arranged. Bowman's membrane is undergoing degeneration only in its anterior portion: this and the basal spindle layer may signify that it had previously suffered at this point and had partially recovered, but never sufficiently for the basal cells to assume their normal form.

The second step in the destructive process is illustrated at another place in the first section (Fig. III). The anterior limiting membrane is undergoing fatty degeneration and has become partially absorbed in places, and the degeneration has also involved the adjacent corneal fibers. The basal cells in the epithelium have become entirely absorbed, but sufficient time has not elapsed for the adjoining cells to have lost their individual forms on the side which bounds the vesicle. With the exception of loosened and absorbing epithelial cells (Figs. I and II), the contents of the vesicles are fluid, there being no evidence of any coagulable material, other than that the floating cells remained separated from the vesicle wall, and were found in position fixed in the celloidin.

A third stage, in which the bulla has become well established (Fig. IV), is represented in an alumearmine-hematoxylin section taken from the half of the globe that was preserved in glycerine. In this stage destruction has ceased, and regeneration has begun. The epithelium has recovered from the shock, and has fortified itself by increasing the number of its layers, and the layer forming the vesicle wall is no longer indented as in Fig. III, the line of the wall being regular. Bowman's membrane is apparently intact. The drawing, however, being from a section not stained with osmium, the degeneration shown in the other drawings can not be demonstrated. Although the contents of this vesicle were fluid, there was probably some incipient coagulation and considerable nourishment, as indicated by the thickening of the epi-

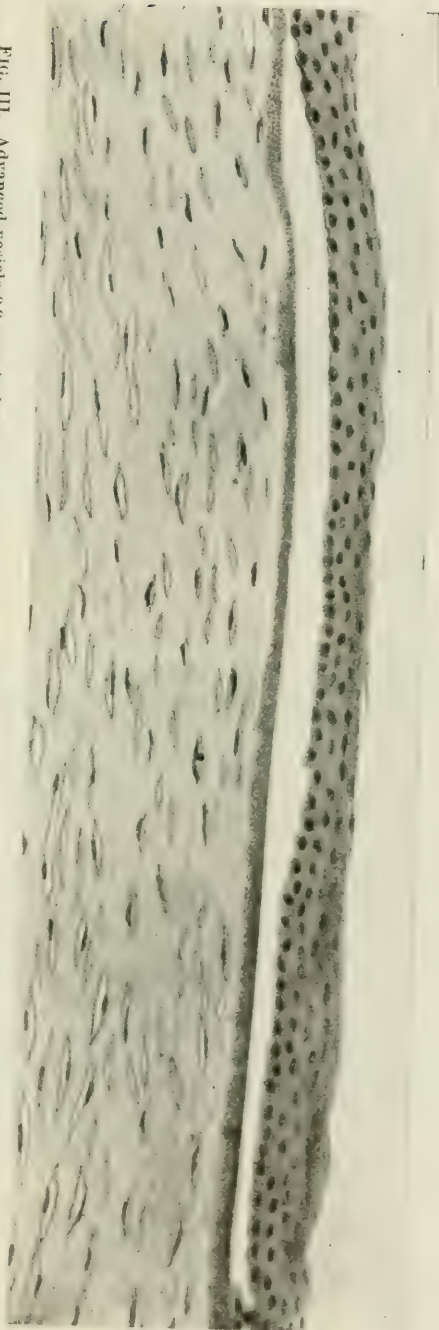


FIG. III. Advanced vesicle 0.9 mm. in length, extending from center of cornea downward. Basal epithelial cells absorbed; Bowman's membrane degenerated and partially absorbed. Also fatty vacuoles in anterior fibers of the substantia propria.

thelium and by the lack of indentation along the outer wall of the vesicle.

Near the bulla, in the same section, there is a demonstra-

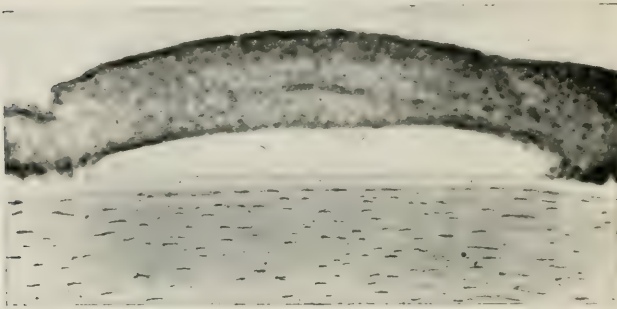


FIG. IV. A well established vesicle 0.5 mm. in length, located 1.5 mm. below center of cornea. Bowman's membrane apparently intact. Not stained with osmic acid.

tion of the fourth stage (Fig. V), in which fibrin, wandering cells and spindle cells have appeared in the vesicle, and are building a new basal membrane between Bowman's membrane

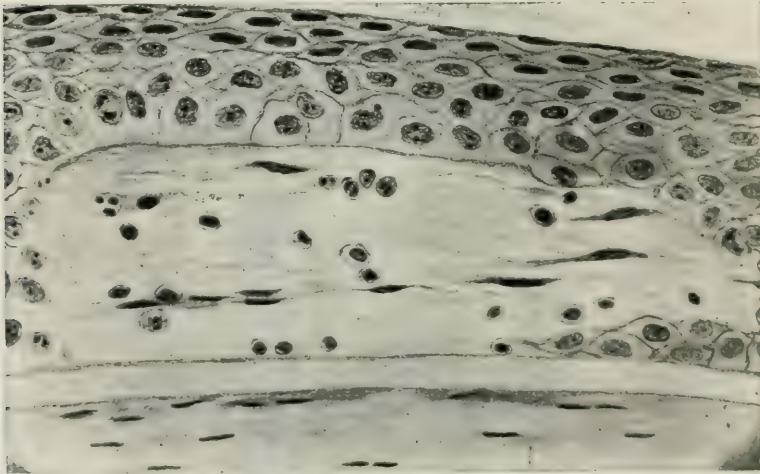


FIG. V. A healing vesicle 0.2 mm. in length, located 1 mm. below center of cornea. Bowman's membrane apparently intact. Not stained with osmic acid.

and the epithelium, and this new material carries with it sufficient nourishment for the basal epithelial cells to begin re-establishing themselves in their cylindrical form. The completion of the regeneration by the appearance of blood-

vessels in the vesicle may be seen in several places, one of which has been selected from an osmium stained section (Fig. VI). The vesicle bears marks which show that it has passed through all the above changes, viz.: the destruction

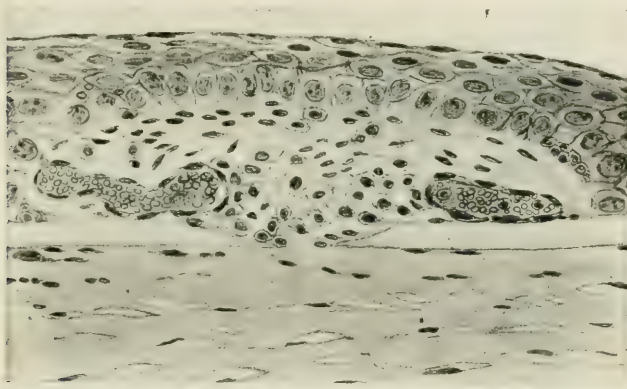


FIG. VI. Healing process well established by the addition of bloodvessels. Bowman's membrane perforated. Vesicle 0.25 mm. long, located 5 mm. above center of cornea.

of Bowman's membrane, the elevation of the epithelium, the influx of fibrin bearing nourishment, and substantial support in the form of bloodvessels.

In many of the sections the loosening of the epithelium from the basal membrane and their absorption is very evident (Figs. VII and VIII), as well as the passage from the dis-

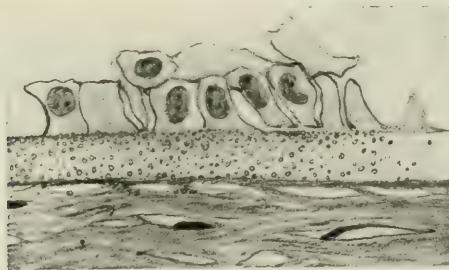


FIG. VII. Degenerated Bowman's membrane; breaking down and absorption of the epithelial basal cells.

eased to the healthy condition in the membrane itself (Fig. IX). There is no widening of the nerve channels that perforate the membrane except at one point, in which the membrane is a very little thinner, and opposite which there is a

small vesicle that contains a new basal membrane constructed of spindle cells. In the anterior wall of the vesicle, and on either side of it, the intercellular spaces are enlarged. No fatty degeneration is present, although it is an osmium

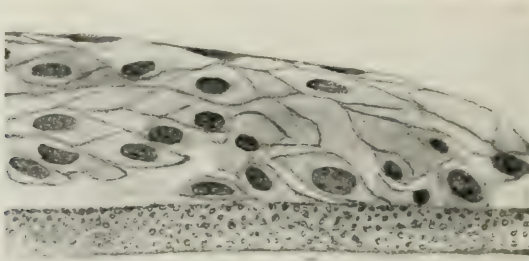


FIG. VIII. Degenerated Bowman's membrane; breaking down and absorption of epithelial basal cells.

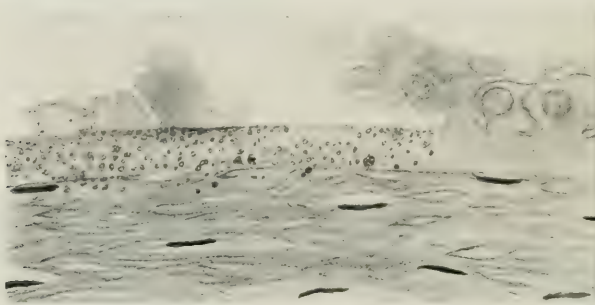


FIG. IX. Absorption of epithelial basal cells over the region of fatty degeneration in Bowman's membrane.



FIG. X. A partially healed vesicle opposite a widened nerve canal in Bowman's membrane: the membrane is thinner at this point. Located 4 mm. above center of cornea.

stained section, but the change in the width of the membrane would indicate that the degeneration had at some time existed (Fig. X).

While the cause for this form of degeneration must be

attributed to lack of nourishment due to the generally diseased condition of the globe, the character of the change and its confinement to the anterior limiting membrane may explain both the formation of the vesicle, and the liability to frequent relapse. In the whole diseased area there is no marked fatty degeneration of the epithelial cells, and only here and there in the extreme anterior layers of the cornea are fatty vacuoles to be found. Nowhere is there any excess of leucocytes or wandering cells, except where the nourishment is already well established (Figs. V and VI). Also the epithelium is intact over all but a very limited portion of the region involved, thus excluding as causes the degeneration of the epithelium, or its loss, and the exposure of the membrane. Further, there was no excessive œdema of the cornea, notwithstanding Descemet's membrane was denuded of its epithelium in two places.

The sections support Leber's original opinion, that the vesicle or bulla is an excessive accumulation of nourishment to a diseased region, the accumulated material, however, is of such poor quality that a quantity of it is required to be of value. Its volume, also, is increased by the liquefaction of the basal cells, and this liquefaction itself may be a process in the regeneration, the nourishment contained in the basal cells being diverted to support the outer epithelial layers until other aid can be established. As only the anterior limiting membrane seems primarily to have been involved, it is not unreasonable to infer that a similar condition may exist in other forms of indolent superficial keratitis, and this may explain the tardiness which accompanies the recovery of such lesions.

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¹¹ Nuel, Arch. d'Ophthalmologie, 1893, 13, p. 608. Norris and Oliver, System. iv. p. 208.

¹² Panas, Lecons de Clinique Ophthalmologique, Paris, 1899, p. 142.

¹³ de Schweinitz, Ophthalmic Record, Feb., 1902.

¹⁴ Greeff, Lehrbuch der Speciellen Pathologischen Anatomie, Berlin, 1902, 1. p. 121.

¹⁵ de Schweinitz and Shumway, Archives of Ophthalmology, xxxii, 3, p. 257.

BOOK REVIEWS.

THE OPHTHALMIC YEAR-BOOK. A digest of the literature of Ophthalmology, with index of publications for the year 1903. By EDWARD JACKSON, A.M., M.D. With 45 Illustrations. [The Herrick Book and Stationary Co., Denver, Colorado, 1904.] Price, \$2.00.

This year-book is a very welcome addition to every ophthalmologist's library. In it the author gives the main publications which during the year have appeared in the now very numerous ophthalmic journals, arranged according to subjects. In this manner anyone not able to read all the Journals from lack of time or knowledge of the foreign languages, may get the gist of what has been published containing new ideas or facts, as selected by one who is as capable as any one can be to make such selections. Every man interested in progressive ophthalmology should have this book on his shelves. Print and illustrations are good.

ALT.

THE TREATMENT OF RHEUMATIC IRITIS.

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"RHEUMATIC" iritis is a term loosely applied to iritic inflammations occurring in patients who will answer "yes" to the question: "Have you had rheumatism?" Such a classification, however, is of doubtful accuracy. In the following cases I have been careful to select only those in which acute attacks of rheumatism have preceded the iritis within such a comparatively short period as to have a direct bearing on the iritis; and again only those in which severe pain was a prominent feature.

In the treatment of rheumatic manifestations, both local and general remedies were prescribed. In Case IV the relative value of the two methods of medication may be very closely estimated; and Case VI affords an opportunity to judge of the advance in treatment.

As already remarked, pain was the most important symptom in all the cases, and the success of the treatment is directly proportionate to the disappearance of the pain. In all six the patient was relieved of pain in a very much shorter time than was formerly possible when local treatment with an absorbable salicylic compound had not as yet been instituted.

Further remarks are unnecessary, as the histories of the cases speak for themselves.

Case I. Patrick C., aged 45 years, a driver, came for treatment on December 1, 1903. Two months previously he was unable to work for about ten days owing to a severe attack of lumbago. His left eye was considerably injected; there was great pain and much photophobia, which had been the condition for one week before I saw him. The iris was adherent to the lens capsule, but the adhesions were broken down with atropin. Three leeches were applied to the left temple; hot bathing and instillations of a one per cent. solution of atropin sulphate given three times daily, together with 15 grains of sodium salicylate. At the end of five days there was no change in the condition, and the patient was receiving hypodermic injections of one-quarter grain of mor-

phine sulphate twice daily because of the great pain. At this time mesotan was called to my attention. This case being so typically a rheumatic one, it afforded the best possible opportunity to test this new synthetic compound. A mixture of equal parts of mesotan and cotton seed oil was applied to the brow, temple and cheek of the left side, four times during the day. The pain still continued and hypodermic injections of morphia sulphate, one-quarter grain, were given twice during the day, and after the second injection the patient slept for five hours. The next morning the pain had diminished somewhat, but the congestion was still as marked. The following day (the seventh of treatment) the application of the mesotan mixture was continued, but no morphia was administered and the hot bathing stopped. The pain gradually subsided and the eye began to bleach until on the twelfth day there was no pain and but slight peri-corneal injection. Local treatment, except one per cent. solution of atropin sulphate, was discontinued on the fourteenth day, and the patient put on aspirin, ten grains, four times daily. On the eighteenth day of treatment the atropin was stopped and the patient discharged. I have seen him three times since, the last time on March 25th, and the eye was entirely normal.

Case II. Wolf T., aged 45 years, tailor, came for treatment on December 11, 1903. In February and again in November, 1903, he had attacks of muscular rheumatism on both of which occasions his shoulder was so lame as to prevent his working for several days. The left eye had considerable peri-corneal injection, the iris was swollen and sluggish and the eye intensely painful. I saw him on the the third day of the attack. A one per cent. solution of atropin sulphate was instilled three times daily; aspirin, ten grains, was given four times a day, and an application of fifty per cent. solution of mesotan in cotton seed oil made to the left brow, cheek and temple. I saw him again on the second day following; the pain had entirely disappeared and the injection was diminished. Treatment was discontinued four days later, the ninth day of the attack. I saw this patient three weeks later and the eye was entirely normal.

Case III. Annie G., aged 18 years, seamstress, came for treatment on December 18, 1903. In March, 1903, she was

confined to bed for twenty-one days with acute articular rheumatism. The left eye was very painful and had been so for a week. There was not much peri-corneal injection, but posterior synechiæ, which were broken down with atropin.

The patient was given aspirin, ten grains four times a day; instillations of a one per cent. atropin solution made three times daily; and a fifty per cent. solution of mesotan in cotton seed oil was applied to the brow, cheek and temple. The conditions did not change until four days later, when the pain began to diminish and finally disappeared altogether with all the other symptoms. Treatment was discontinued on the seventeenth day of the attack.

Case IV. Henry G., aged 28 years, a proof reader, came for treatment on January 9, 1904, at which time he was suffering from sciatica. He had had several attacks of sciatica within the previous two years. The right eye was quite painful, particularly on pressure or movement; the conjunctiva was edematous; the iris swollen and discolored. The patient was put on aspirin, twenty grains, four times daily, and instillations of a one per cent. atropin solution were made t. i. d., and mesotan pure applied to the right brow, cheek and temple every three hours from 7 a. m. to 10 p. m.

The recovery was very prompt so far as the pain in the eye and the iritic congestion were concerned, but the conjunctival chemosis persisted for seventeen days. In this case advantage was taken of the opportunity afforded by the presence of pain in different parts to test the relative value of the local treatment in addition to the systemic, so that while mesotan was applied about the eye, and aspirin given internally, no local applications were made to the sciatic nerve region. The pain in and about the right eye was relieved after four days, while the sciatica continued for two weeks, at which time the local application of mesotan pure over the course of the sciatic nerve was instituted, the pain then entirely disappearing in three days.

Case V. William B., aged 38 years, a painter, consulted me on February 2, 1904. For the past five years he has had repeated attacks of muscular rheumatism, the last in December, 1903. The left iris was swollen, discolored and bound down by adhesions. The peri-corneal injection was intense

and the pain most severe. The eye had been painful for a week, but had not become "bloodshot" until three days ago. Patient was put on aspirin, ten grains, four times daily; mesotan, fifty per cent. solution in cotton oil was applied to the left brow, cheek and temple, and instillations of a one per cent. solution of atropin given three times a day. The adhesions were broken down by atropin. The recovery was prompt, treatment being discontinued on the sixth day (the ninth day of the iritis). I have seen this patient once since, on April 10th, at which time the eye was entirely normal.

Case VI. Gustave K., aged 37 years, a clerk, was seen first in March, 1902, at which time he had an iritis. I have treated him twice since, once for a double iritis. In all he has had seven attacks of articular rheumatism.

In March, 1902, he was given sodium salicylate, fifteen grains, three times daily, and instillations of a one per cent. solution of atropin sulphate three times a day. Treatment was continued for twenty-five days. In December, 1902, he had a double iritis. This time he was given quinine salicylate, six grains, four times a day, and instillations of a one per cent. solution of atropin sulphate t. i. d., together with hot bathing. The attack lasted five weeks. On November 23, 1903, he returned with an iritis which like all the previous attacks was accompanied by considerable pain. The pericorneal injection was slight. One per cent. solution of atropin sulphate was instilled three times a day, and ten grains of aspirin administered t. i. d., with the application of a fifty per cent. solution of mesotan in cotton seed oil to the brow, cheek and temple. Treatment was stopped on the eleventh day of the attack, recovery having been complete.

PAMPHLETS RECEIVED.

"A Case of Choroidal Inflammation, with Permanent Loss of Vision, Caused by Excessive Use of the Eyes." By D. B. St. J. Roosa, M.D.

THE TREATMENT OF KERATOCONUS.*

BY PROF. DR. ELSCHNIG.

VIENNA.

Translated by Adolf Alt, M.D.

IN 1894 in an exhaustive publication¹ I have expressed it as my conviction that the cauterization of the eyes of a keratoconus with a dull red galvanocauter constitutes the best and safest treatment of keratoconus. At that time I also described a technical modification in cauterization, which almost always succeeds in producing by one application the desired result, viz., flattening of the apex of the cone and improvement in vision. As is well known the scar formation consequent on cauterization is, other things being equal, the denser and more resistant, the earlier and more complete is the formation of bloodvessels from the marginal loops of the cornea.² When cauterizing solely the apex of the keratoconus we certainly in most cases produce a small flattening of the cone by the scar formation, yet the scar, almost always devoid of vascularization, is thin, bluish, translucent and so yielding that after a short time a new ectasia is formed. Therefore, according to the uniform opinion of all the authors several cauterizations must be made at short intervals in order to get a good result. Things are quite different when the vascularization of the expected scar at the apex is at once induced by the first cauterization, *by joining the deep burn of the apex by means of a band of superficial burning, and of equal width, to the nearest part of the corneoscleral margin.* Even before the deep eschara of the apex has been fully cast off, numerous bloodvessels grow into this bridge from the corneal margin; usually about three weeks after the cauterization two-thirds of the eschara are vascularized, the scar still becomes denser and smaller in extent, thus diminishing the corneal curvature and flattening the cone. After about two months only this process of scar formation seems to have reached its end.

It seems to be generally accepted at this date that cauterization is the sovereign treatment for keratoconus. Yet, my

* Read before the Vienna Ophth. Society, Feb. 10th. 1904. Wiener Klin. Rundschau, No. 20.

suggestion to improve this method has thus far received but little attention, although the value of my method cannot be doubted, and although a deterioration of vision through the bridge-like junction between the eschara on the apex and the neighboring corneal margin is absolutely out of question. The apex of the cone always lies eccentrically, and even should this not be the case, it is best to try to get the position of the scar somewhat eccentrically in order to get a partially free pupil. I may here refer to a few of the recent papers on the treatment of keratoconus. Thus Hirschberg³ advises three to four cauterizations made at intervals of 10 days, as the best method. In 1902, at the Karlsbad meeting of naturalists, L. Müller (Vienna) recommended parenchymatous injections of bichloride of mercury in order to strengthen the otherwise insufficient central cauterization scar. *Only* one, but he an authority, supported my observations unconditionally. Czermak, in his text-book on ophthalmic surgery,⁴ states that the cautery is doubtless the best treatment for keratoconus, and without reserve accepts my views that as much can be gained with one cauterization made according to my method as otherwise by repeated cauterizations. Czermak again expressed this opinion more recently (1902) during a discussion on keratoconus in the ophthalmic section of the Society of German Naturalists and Physicians at Karlsbad. In order to save my doubtlessly improved method of cauterization for keratoconus from total oblivion I herewith report two cases which I have treated during the last year:

Case 1. J. B., aged 21 years, had no eye disease till he was 11 years old. In his 11th year the left eye was injured by an arrow and vision remained henceforth deteriorated. During his 17th year he observed a further diminution of vision in this injured eye. He went to the Innsbruck eye clinic where a glass was prescribed. Up to 1901 he could work at his avocation as sculptor; more recently his vision has become so poor that he is totally unfit for work.

When I saw him first, on April 22d, 1902, there was a typical keratoconus in the right eye, $V = 0.1$ when the palpebral fissure was strongly compressed, Jaeger 3 with difficulty at 10 cm. When the palpebral fissure was of normal width, $V = \frac{1}{100}$, not improved by glass, Jaeger 6 at 10 cm.

The left eye also showed a typical keratoconus, and furthermore a small, penetrating scar in the inner lower quadrant with a small anterior synechia of the pupillary margin, while the lens was normal and in proper position. $V = \frac{1}{2000}$ through the compressed palpebral fissure Jaeger 6 can be read.

The patient did not at once agree to the proposed cauterization but underwent treatment elsewhere (April 22 to September 15, 1902). The left keratoconus was cauterized, then an iridectomy was made and finally a traumatic cataract, which had resulted from this operation, was extracted from this eye.

In May, 1903, I again saw this patient. The ectasia of the right cornea was increased and the following conditions were found:

Stat. praes., June 2d, 1903. The right cornea has the shape of a truncated cone, the flat apex of which lies in the lower inner quadrant of the cornea near its center. There is a light gray opacity at the apex which consists of numerous fibres crossing each other, net-like, in an irregular manner and situated in the different corneal lamellae. The corneal surface all over is smooth and mirrors well.⁵ When viewed with the ophthalmoscope the opacity is barely visible when turning the mirror. The apex is highly myopic, the marginal part of the cornea nearly emmetropic. The keratoconus shows the well-known ophthalmoscopic and skiascopic phenomena.

With a wide palpebral fissure $V = \frac{1}{30}$, with—15 D. = 0.1. Jaeger No. 13 at 5 cm.

With the head bent strongly backwards and to the left, and when the palpebral fissure is reduced in size as much as possible by pushing the lower lid upwards $V = 0,3$; Jaeger No. 1 at 5 cm. with good illumination.

On July 15th, 1903, I cauterized this keratoconus in Prof. Schnabel's clinic. At first I burned the apex with a dull red galvanocauter until it was concave and then connected this burn by a bridge of superficially burnt tissue with the nearest, the inner lower, corneal margin.

Under pressure bandage normal healing resulted. About the seventh day the eschara was cast off and a rich vascular-

ization began to grow from the corneal margin along the edges of the burn. Scar formation was finished on July 27th; a dense flat scar filled with numerous fine bloodvessels partially filled the lower inner corneal quadrant, leaving half of the medium-wide pupil free.

In the beginning of September I tattooed the scar twice.

Beginning with October the patient was able to resume his work as sculptor and was perfectly able to perform his duties.

Now (April 10th, 1904) $V = \frac{6}{36}$, with -2.5 D. cyl. ax. 20° with wide palpebral fissure $V = \frac{6}{18}$, with Schnabel's figures $V = 0, 4$. With the correcting lens Jaeger No. 1 is read at 11 cm., Jaeger No. 5 at 30 cm., and Jaeger No. 7 at 35 cm.

Case II. Law student R. H., 23 years old. Five years ago when he, while reading, accidentally shut the left eye the patient noticed that he could not read with the right eye alone. As vision further deteriorated he consulted Dr. Hernheiser at Prag, in 1900, who diagnosed keratoconus and recommended cautery. Since then no further change seems to have taken place.

October 3, 1903, I saw the patient for the first time. The left eye was normal, V . with -3 D. $\odot - 3$ D. cyl. ax. $150^\circ = 0, 8$.

The right eye shows a corneal conical ectasia of high degree, rather peculiar, since the most prominent part which lies in the center a little below the horizontal meridian, is of horizontally oval shape. Thus the whole cornea appears as a truncated cone flattened from above and below. As is found out by palpation under cocain anesthesia the most prominent part is very thin and is the seat of the characteristic net-like opacity in the deeper layers. The surface is perfectly smooth and mirror-like, just as in case 1.

V is reduced to the counting of fingers at $1\frac{1}{4}$ m. With -20 D. $\odot - 10$ D. cyl. ax. 180° , he says he sees better. With the narrowest stenopaic slit and -20 D. $V = 0, 1$. He reads Jaeger No. 4 at 1 to 2 cm., leaning the book against forehead and nose.

On September 9th, 1903, I cauterized the cone in Prof. Schnabel's clinic. With a dull red galvanocauter I first deeply burned the lateral three-quarters of the ectatic part

and then burned more superficially to the lateral lower corneal margin. The eschara reached for about 3 mm. beyond the vertical meridian toward the nose and was about 4 mm. broad.

Under a compressive bandage the eschara was cast off after a week and newformation of bloodvessels took place from the corneal margin. After two weeks the loss of substance was completely covered over by epithelium, but only slightly dim and became again ectatic. Then only the vascularization increased rapidly and a dense white scar formed and flattened the corneal curvature. The size of the scar also became slowly less, as if a contraction had taken place. Beginning with November 10th, 1903, the patient could resume his studies and vision gradually improved materially.

On February, 1904, $V = \frac{6}{30}$; with 3 D \bigcirc — 2 D. cyl. ax. $90^\circ = \frac{6}{24}$; some letters of $\frac{6}{18}$ (Schnabel's figures = 0, 2); with — 2 D cyl. ax. 90° Jaeger No. 1 at 8 cm., No. 7 at 12 cm. Shading the eye with the hand materially aids vision.

In order to observe the case better I have not yet tattooed the scar, which, as a rule, improves vision still further.⁶

I should not like to terminate this little communication without adding a few remarks on the ideal objects of the treatment of keratoconus. I believe that it is possible to reduce the curvature of the cornea to the normal by means of the cautery in the milder cases only. In higher degrees of ectasia this is difficult to obtain, but it is not even necessary to attempt it in order to get a satisfactory improvement of vision. It is probably sufficient in all cases to reduce the curvature and by means of a dense scar (with subsequent tattooing) to eliminate the worst part, the apex of the cone.

This at the same time stops the further progress of the ectasia. I do not think an optical iridectomy is of use after the scar has been formed, in most cases it is even detrimental, as it reduces vision, as a rule. Should the scar exclude too much of the pupil it would be better to try and give improved vision by the use of atropine or scopolamine, and only when absolutely necessary, to make an iridectomy *upwards*.

The enormous advantage of cauterization of the keratoconus over all other methods lies in the certain absence of

prolapse and incarceration of the iris with their consequences. Therefore, when cauterizing, a perforation should be avoided, especially since it is useless. Cauterization is almost without danger. Lately I heard from a young colleague of a case in which panophthalmitis occurred four days after the cauterization of a keratoconus (treated in an ambulatory clinic), and the eye was lost. This, however can only warn us to make as few cauterization in the individual case as possible; and this seems best subserved by my modification of the cauterization as here set forth.

¹ Klin. Monatsbl. f. Augenhk., 1894. p. 25.

² l. c. p. 55.

³ Berl. Klin. Wochenschr. 1902. No. 20. See, also, Morton, Klin. Monatsbl., 1903, p. 586.

⁴ Die augenaerztlichen Operationen, 1896. p. 643.

⁵ This proves, like my former observations (l. c.), that the opacity at the apex of the cone comes on after the ectasia has existed for some time independently of all exterior influences, and is therefore due to the ectasia itself (l. c., p. 4). I want to state this again, since in the discussion at Karlsbad Liebreich returned to the old opinion, that the opacity at the apex of the cone is due to mechanical insults.

DIONINE: A NEW OCULAR ANALGESIC.*

By JAMES HINSHELWOOD, M.A., M.D.

Surgeon, Glasgow Eye Infirmary.

IN dealing with disease in such a sensitive organ as the eye, our aim must be not only to cure the disease, but during its course to give relief to the sufferings of the patient. Every agent which can contribute to the relief of pain should therefore be welcomed as an additional weapon to our therapeutic armamentarium, which cannot be too well stocked. At the meeting of the British Medical Association in 1898 at Edinburgh I made a communication¹ on holocaine, an ocular anæsthetic and analgesic, greatly superior to cocaine in its power of relieving the deep-seated pain of ocular disease. On reading Darier's recent work² on ocular therapeutics my attention was directed to dionine as an ocular analgesic, and I have since made extensive use of it with great success, both in my private and hospital practice. Although dionine has

*British Medical Journal.

been used for several years in general medicine as a sedative to replace codeine and morphine in bronchitis, pulmonary emphysema, and bronchial asthma, its use as an ocular analgesic is practically unknown in this country, and hence I wish to briefly record my personal experience of this new and powerful agent for the relief of pain in the eye.

Dionine, or ethyl-morphine hydrochloride, is a white, odorless crystalline powder freely soluble in water. I have used the dionine chiefly in 5 per cent. aqueous solution, or made up with vaseline as an ointment in similar strength. Where there is great lachrymation I prefer to use it as an ointment, which smears itself over the globe of the eye, and is gradually melted and absorbed. In such cases a few drops of a solution are rapidly diluted with tears and washed out of the conjunctival sac, and therefore it is not so effective as the ointment. Even in 2 per cent. aqueous solution, or as an ointment of the same strength, dionine has marked analgesic properties, and hence, where the pain is not severe and the inflammatory condition of the eye not very acute, the strength of 2 per cent. may be quite sufficient to give the necessary relief.

When the 5 per cent. solution is dropped into the conjunctival sac it does not modify in any way the sensitiveness to touch of the cornea or conjunctiva. The gentlest contact with cornea or conjunctiva is felt just as distinctly after the instillation of the dionine as before it, hence it is not an anæsthetic like cocaine or holocaine. It is of no use therefore, for the removal of foreign bodies or for performing operations of any kind on the eye. But if the patient is suffering from a painful affection of the eye, such as iritis, irido-cyclitis, glaucoma, ulcer, or inflammation of the cornea, the instillation of the dionine solution will always soothe, and often give complete relief, for several hours from the severe pain which accompanies those affections of the eye. Dionine is not an ocular anæsthetic, but is a powerful ocular analgesic.

Does the dionine give this relief by its local action on the globe of the eye, or does it act on the central nervous system, after being absorbed into the general bloodstream partly by the conjunctiva and partly by the tear passages? That its action is purely local is proved by the fact that when both

eyes are painful relief is experienced only by the one into which the dionine has been instilled, the other eye remaining painful as before.

Cocaine and holocaine are both anæsthetics and analgesics. Cocaine and holocaine render cornea and conjunctiva insensitive, so that we can perform operations on the eye without pain, and for this purpose they stand so far unrivalled. They are also analgesics, relieving the pain of disease when it is superficial, as in abrasion and ulcers of the cornea. But in this analgesic power dionine is undoubtedly superior both to cocaine and holocaine, and hence the great value of this new agent in the treatment of diseases of the eye. In the deep-seated pain produced by iritis, irido-cyclitis and glaucoma, the analgesic effect of cocaine and holocaine is much less powerful, and particularly that of cocaine. Sometimes cocaine actually increases the pain by elevating the tension of the eye, and hence cocaine should be used with the greatest caution as an analgesic in inflammatory conditions of the eye. I have recorded a case³ where an attack of acute glaucoma was brought on by the use of cocaine. In glaucoma cocaine should never be used for the relief of pain. Holocaine can be freely used in glaucomatous cases, as it has no effect whatever on the tension of the eye. It is in these cases of deep-seated pain due to inflammatory affections of the eye that the analgesic effects of dionine are of the greatest service. We can give the patient relief no doubt by the internal administration of morphine by the mouth or hypodermic injection, but this method has the greatest disadvantage in frequently deranging the digestion and disordering the patient's nervous system. It is a great step in advance to give the patient relief by a local analgesic alone, and this we are able to accomplish in most cases by dionine.

I have recently, in cases of deep-seated pain due to inflammatory affections of the eye, such as iritis, cyclitis, irido-cyclitis and glaucoma, carried out comparative experiments with regard to the power of cocaine, holocaine and dionine in relieving pain. I have used three solutions—cocaine, 5 per cent.; holocaine, 1 per cent.; and dionine, 5 per cent. I have used these solutions alternately in the same cases with the view to determine the degree and also the duration of the

relief afforded. Cocaine is by a long way at the bottom of the list both as to the degree and duration of the relief afforded. Its analgesic effects are not to be compared with those produced by holocaine and dionine in this particular class of cases. Cocaine only gave very partial relief as compared with the great relief afforded by holocaine and dionine. The analgesic effects of the dionine were found to be even greater than those of holocaine.

With regard to the duration of the relief afforded, both holocaine and dionine were much superior to cocaine; but here, too, dionine was at the top of the list. The partial relief from cocaine rarely lasted more than an hour, whilst the analgesic effects of holocaine and dionine lasted for three and sometimes for four hours. For the relief of the severe deep-seated pain in inflammatory affections of the eye, both as regards degree and duration of the analgesia produced, I found dionine the most powerful agent, next to it holocain, and a long way inferior to both cocaine.

There is an occasional effect of the dionine regarding which the patient must be warned, otherwise it may cause him much needless alarm. After the first instillation, there sometimes appears an intense chemosis of the conjunctiva, which swells up and overlaps the cornea. This need cause no alarm, as it rapidly subsides, and it is even an appearance to be welcomed, as in these cases where the dionine produces intense chemosis its analgesic effects seem to be greatest. This chemosis of the conjunctiva appears only after the first or second instillation of the dionine, and never after the subsequent ones, and need not interfere in the slightest degree with the regular use of the drug. I have never seen it after the use of 2 per cent. solutions, but only after the use of 5 per cent. solutions. The dionine drops or ointment may be used every four, six or eight hours, according to the severity of the pain and the effect produced.

¹ British Medical Journal, 1898.

² Darier—Leçons de Thérapeutique Oculaire.

³ Ophthalmic Review, 1900.

MEDICAL SOCIETIES.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.*

JOHN TWEEDY, P.R.C.S., President, in the Chair.

Thursday, May 5th, 1904.

THE RETINA IN ANENCEPHALY.

MR. STEPHEN MAYOU read a paper on the Retina and Optic Nerves in Anencephaly. He dwelt on the controversy which exists as to whether the axis cylinders of the optic nerve are developed from the brain or retina, or from both these structures, as is more usually held. The myeline sheaths, however, seem to develop from the brain towards the retina. In the full-term anencephalic fetus which the author obtained there was an arrest of development at the stage when the primary and secondary optic vesicles are formed, and the nerve sheaths differentiated, but before the development of the axis cylinders or chiasma, of which no trace was found. The choroid was hypertrophied and the retina showed a normal pigment layer. The layers of the retina were present except the nerve fibre layer which was completely absent. The author concluded that the development of the axis cylinders was directly dependent on the proper development of the cerebral centers.

PANNUS AND ASSOCIATED CORNEAL CHANGES.

Major H. HERBERT, I.M.S., read this paper. He described some of the corneal changes seen in the acutely progressive forms of trachoma. In many cases the whole cornea stained with fluoresceine showing this to be inflamed. When pannus was developing this part never stained, showing its essentially protective nature. In old cases the author described "lymphoid pannus;" these nodules were situated on the basis of an old diffuse corneal opacity, some of them coalesced and their margins might overlap the corneal edge. The severe forms became progressively thicker, and ultimately

*British Medical Journal.

pannus crassus or carnosus was developed. Apart from the above, the limbus alone might be thickened, but this occurred almost exclusively in follicular conjunctivitis. The permanent result of mild pannus was the slight extension downwards of this scleral margin. Indentations might be seen in more severe cases, which were probably not due to ulceration but to a reabsorption of the lymphoid nodules.

THE OPERATION FOR TRICHIASIS.

Mr. W. E. CANT (Jerusalem) read a paper on this subject. Trachiasis was so extremely common in the East that out of 68,000 cases treated in fifteen years 12,200 suffered from it. The great difficulty experienced in treatment was the shrinking of the conjunctiva and the great thickening of the tarsus itself; the latter might be five or six times its natural thickness. He discussed the various operations, and gave his preference to Snellen's, modified to suit individual cases, as this operation (removing a wedge-shaped piece of the tarsus) was easy of accomplishment; it turned the lashes well out; there was no raw surface left to heal. It was applicable to all cases, and could be extended in various ways to meet varying degrees of deformity. For the severe conditions in the East he suggested the following modifications: (1) Instead of the simple wedge-shaped piece of tarsus that was removed, an excision of a U-shaped piece of tarsus and tissue right down to the conjunctiva; (2) the sutures, instead of being entered above or in front of the lashes and out through the upper lip of the cut, were entered from the lid margin behind or beneath the lashes and out through the lower lip and then passed in and out of the tarsus high up, well above the upper margin of the cup, so that on drawing the ends together great eversion was produced; (3) when the entropion extended quite into the canthi, canthotomy and canthoplasty were employed as adjuncts.

Dr. ROCKLIFFE read short notes on the following cases:

1. *Atrophy of both Optic Nerves with Primary Amenorrhœa.*—This case had been under observation for six years, with steadily increasing atrophy, and no other special or general symptoms. There was deep blue cupping, but no neuritis or hæmorrhage. The retinal vessels were not attenu-

ated, and with the exception of an infantile uterus and undeveloped sexual organs, the remaining organs were healthy.

2. *Optic Neuritis following Concussion of the Globe.*—The patient received a severe blow on the eyeball (right) immediately followed by loss of vision, with intense optic neuritis. There was neither wound of the eyeball, traumatic cataract, nor displacement of the lens, hæmorrhage into the vitreous, ruptured choroid, nor detachment of the retina. There was, in addition to the optic neuritis, a hæmorrhage into the yellow spot with iritis. Three months later the vision of the left eye failed (?functional). Six months later the vision of the left eye became normal, the right improved to $\frac{6}{18}$ and J.4.

3. *Unusual Sequence to Cataract Extraction.*—The patient, a decrepit old man, after an uncomplicated extraction developed on the fourth day a dense diphtheritic-looking membrane of both lids and surrounding cornea. The pupil became blocked: there was no chemosis or pain, nor was there swelling of the lids. The corneal epithelium exfoliated and the eye was eventually excised, when the cicatrix appeared healthy and perfectly healed. The anterior and posterior chambers were normal, but the coloboma and iris were blocked with thick yellow membrane, with considerable iritic thickening.

4. *A Peculiar Outbreak of Granular Ophthalmia.*—There were 7 persons, all of whom had been nursing a diphtheric child. They each had an acute attack of granular ophthalmia without trachoma or membrane. It affected the lower lids only in 5 of the cases; both eyes were effected at intervals of a few days. In all there was a subnormal temperature, depression of spirits, and lassitude, but no other general symptoms. The attack ran a similar course in each case and lasted about fourteen days. The bacteriological examination was negative except in one examination where the bacillus xerosis in large quantities was present. The examination was carried out by the Clinical Research Committee.

CARD SPECIMENS.

Card specimens were shown by the following: Messrs. Whitehead, Harman, Bronner, Doyne, Parsons, Lawford, Taylor, Bickerton, Mayou, Paton, Blair, Silcock and Anderson.

ABSTRACTS FROM MEDICAL LITERATURE.

By W. A. SHOEMAKER, M.D.

ST. LOUIS, MO.

TORTICOLLIS AND SPINAL CURVATURE DUE TO EYESTRAIN.

Geo. M. Gould (*American Medicine*, March 26) refers to a number of cases collected from the literature of the subject, and reports one case in which the conditions were evidently caused by the patient's efforts to neutralize her astigmatism. The conclusions to be drawn from a study of these cases are: (1) Habitual abnormal position of the head is frequently the cause of spinal curvature. (2) These abnormal positions may be due to some error of refraction, which necessitates the torticollis, wry-neck, or depression, in order to secure clearer vision. (3) The error of refraction is usually a slight asymmetry of the axes of astigmatism, whereby the clearer-seeing or most used eye (usually the right in right-handed persons) has an axis 10° or 15° to either side of 90° or 180° , i. e., at about axes 75° , 105° , 165° or 15° . (4) The heterophoria, which has been the supposed cause of the functional torticollis, etc., is itself usually a result of the refractive error, proper correction of which at a sufficiently early age, cures the heterophoria, the torticollis, and the spinal curvature.

DIONIN—A NEW AGENT IN OPHTHALMIC THERAPEUTICS.

Wendell Reber (*Therapeutic Gazette*, Feb. 15th) summarizes the therapeutic action of dionin in ophthalmic practice as follows:

1. That dionin possesses properties at present inherent in no other drug thus far used in ocular therapeutics.
2. That it is an analgesic of no little power, and is frequently of value in alleviating the pain of iritis in those cases in which atropine does not relieve.

3. That the action of atropine seems to be enhanced by dionin.

4. That it has, upon the eye, a powerful vasodilator and lymphagogue action.

5. That it is of value, if used to the point of distinct reaction, in promoting the absorption of exudation deposits upon the anterior capsule in the pupillary space, and also in helping the absorption of post-operative debris after cataract.

6. That it certainly does help to clear up the corneal opacities in some cases of interstitial keratitis.

7. That it seems without effect in all other forms of corneal opacities.

8. That its influence on the glaucoma process is yet unsettled.

9. That it should be widely used and the effects of such use reported, in order that a final correct estimate of the value of the drug may be made.

SOME EXTERNAL DISEASES OF THE EYE DUE TO RHEUMATISM.

Richard Kalish (*Medical News*, April 23rd) says that there are a number of external diseases of the eye due to rheumatism which are not recognized as being of such ætiological origin. These are: (1) marginal blepharitis of the young adult; (2) recurrent hordeoli; (3) recurrent chalazia; (4) circumscribed bulbar conjunctivitis; (5) limited circumscribed bulbar conjunctivitis; and (6) striated keratitis. Unless patients with these affections are placed on proper anti-rheumatic treatment and regimen, they will become the victims, usually, of irremediable injuries.

SURGICAL TREATMENT OF PERIPHERAL OPTIC NEURITIS.

Koenig (*Bulletin de l'Académie de Médecine*, Paris), attributes peripheral optic neuritis to some preceding infection, such as la grippe, typhoid fever, gonorrhoea, etc. This form is characterized by the absence of vascular stasis and brain disturbances, by the limitation of the edematous infiltration to the optic papilla and by its unilateral development. It is the result of circulatory disturbances limited to the papilla and bulbar end of the optic nerve. As it is impos-

sible to act directly on the posterior pole of the eye, he applies treatment to the anterior pole—knowing the close relationship between the two—and treats the condition by sclerotomy. His experience has been limited but satisfactory with this procedure.

TREATMENT OF GRANULAR EYELIDS.

Post (*Deutsche Medizinische Wochenschrift*, Jan. 1st) recommends a device which projects a stream against the inflamed lids, producing a hyperæmia which has a beneficial action. He uses a warm, physiological salt solution containing corrosive sublimate in great dilution.

SQUINT.

Albert B. Hale (*Journal of the Amer. Med. Ass'n.*, Feb. 20th) calls attention to the fact that concomitant squint is caused by failure of the brain to properly fuse the images of the two eyes, and arises early in life before this function is well established, having as an exciting cause a fever, shock or fright before the sixth year, while the habit of fusing images is being acquired. It is a great mistake on the part of physician and parent to assume that the child will "grow out" of the habit. On the contrary, treatment should be begun early, as soon as the defect is seen. This resolves itself into three factors: (1) Correction of refractive errors; (2) training of fusion sense, by stereoscopic or other exercises; (3) operation.

THE INFLUENCE OF DENTAL DISEASES ON THE ETIOLOGY OF CERTAIN OCULAR DISTURBANCES.

W. O. Nance (*Journal Amer. Med. Ass'n.*, April 2nd) discusses dental caries and its allied processes as factors in the causation of ocular disorders. He points out the anatomic relations existing between the alveoli and teeth and the orbit and its contents, and shows that morbid changes of the one may easily influence, either by continuity or by so-called reflex manifestation, the functional relation of the other. Thus among the ocular disorders that may follow dental diseases are orbital cellulitis and abscess, conjunctivitis, keratitis,

corneal ulcer, iritis, scleritis, papillitis, mydriasis, lachrymation, amaurosis, amblyopia, strabismus, ptosis, interference of accommodation and paresis or spasm of the several muscles of the eye and lids. Interference with normal accommodation and mydriasis are frequently caused by dental changes, and he quotes Galezowski as expressing the belief that eight out of ten cases of third nerve paralysis are due to this cause, instead of its being an invariable index of syphilis, as is generally supposed.

His review of the literature and his observations in his own cases leads him to the belief that in dental disease is to be found an etiologic factor of more than passing importance in many ocular disturbances, and suggests the necessity of a thorough examination by a competent dentist in those instances presenting uncertain causative phenomena.

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ORIGINAL ARTICLES.

A NEW MODIFICATION OF THE AUTHOR'S ANTERIOR CHAMBER IRRIGATOR.

By J. A. LIPPINCOTT, M.D.

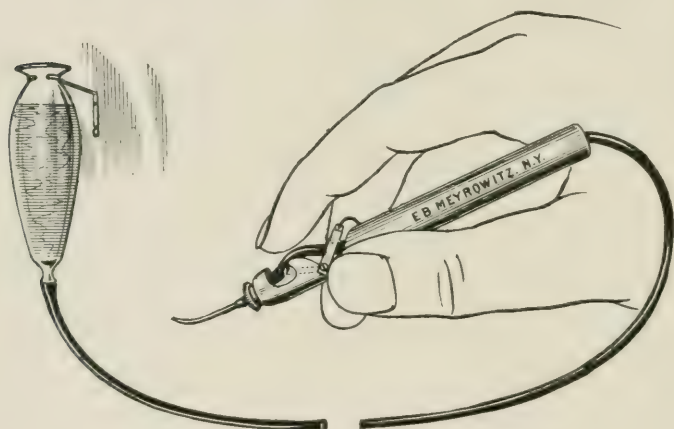
PITTSBURGH, PA.

THE modification consists in the addition of a convenient and effective shut-off designed to prevent the backward flow which may occur if the reservoir is allowed to drop lower than the tip. Reversal of the current would expose the interior of the rubber tube to the risk of contamination and thus necessitate re-boiling in case one or more operations remained to be done at the same sitting. If the shut-off be used before lowering the reservoir, backward flow is prevented and immediate re-boiling is not necessary; it suffices to pass the tip two or three times through the flame of a spirit lamp before proceeding to the next operation. If care is taken to run all the fluid off before lowering the reservoir, the shut-off is not required, in which case it may be left in the position shown in the drawing, viz., lying back against the handle. It should be left in this position when the instrument is not in use, as continuous pressure on the rubber impairs its resiliency.

The irrigator in its new form has a larger tip, permitting of a more generous stream than as formerly made, and the general finish is superior. In other respects it is unchanged. The advantages of this over other instruments which I have

seen are: 1st—Accuracy of manipulation—held like a pen-holder between the thumb and middle finger, every movement responds to the volition of the operator to the extent that his fingers do, which is all that can be expected. 2nd—Accuracy in estimating the force of the stream—by the height of the reservoir, the only exact method. 3rd—Absence of backward flow. Instruments of the *compte-gouttes* type are defective in all these respects.

The irrigating fluid which I have used for a number of years is normal salt solution, which, in the reservoir, should be somewhat above blood heat to allow for cooling in the rubber tube. The reservoir should be held at the height of



from eight to twelve inches above the tip. At the latter height the stream has considerable force.

As a rule, removal of the cortical matter remaining after the expulsion of the nucleus is effected by introducing the tip just within the lips of the wound and slowly moving it from one angle of the incision to the other while the stream continues to flow; but a much freer use of the instrument is sometimes needed, especially to remove cortical masses which adhere obstinately. These may be loosened by direct manipulation with the tip, which, if necessary, may be inserted behind the iris. I have never seen any regrettable results from such free use of the irrigator. Stroking of the cornea in the ordinary way may also help in rebellious cases, but this procedure is very rarely required.

The rubber tubing used in this irrigator is of the purest quality. To make sure, however, that no foreign substance is left in the tube, I am in the habit, before using the instrument for the first time, of rolling the tubing between my thumb and fingers along its whole length, allowing at the same time a large quantity of an alkaline solution (borax) to run through. Before the operating hour the irrigator is boiled along with other instruments in the alkaline solution, having been previously filled with the same fluid.

The experimental stage of irrigation in the operation for cataract is long since past. The value of the procedure is now pretty generally recognized. True, its progress towards general acceptance has not been startlingly rapid, but nevertheless it has been decided. Witness the contrast between the skeptical silence which followed my first paper, read before the American Ophthalmological Society in 1888, and the chorus of approval succeeding Dr. Reik's paper on the same subject at the last (1903) meeting of the same society. The claims made by McKeown, myself and other adherents of the method have been justified by the experience of a large number of operators. It has been demonstrated that

- (1) it removes cortical remains gently, promptly and effectively.
- (2) It is the best mode of removing the blood which occasionally appears in the anterior chamber after the incision and which obscures the subsequent steps of the operation.
- (3) It perfectly cleanses the lips of the wound, allowing accurate apposition and consequent rapidity of union.
- (4) In those cases in which from want of tone the cornea remains inverted after removal of the lens it frequently restores the corneal dome, thus placing the wound lips in proper contact, and at the same time permitting of an immediate estimate of the vision.
- (5) Owing to the more thorough cleansing of the eye it lessens the tendency to, and the density of, subsequent capsular opacity and thus makes secondary operation less frequently necessary.

In addition, I am convinced that it lessens the frequency and the severity of post-operative inflammations of the uveal tract through the comparatively complete elimination of material favorable to germ development and through the speedy closure of the incision giving increased protection against the entrance of germs from the

conjunctival sac, and possibly also through the avoidance of whatever traumatism is involved in prolonged stroking of the cornea.

In perfecting the shut-off I have been materially aided by Mr. E. B. Meyrowitz, of New York, the maker of the instrument.

EYE-STRAIN AS A CAUSE OF MIGRAINE.

By W. A. SHOEMAKER, M.D.

ST. LOUIS, MO.

MIGRAINE is a neurosis, characterized by severe attacks of headache, usually unilateral, coming on in paroxysms which are frequently periodic. With the pain in the head are associated, generally nausea and vomiting, and sometimes ocular symptoms, as photophobia, blurring of vision, bright lights, scotoma scintillans, hemianopsia, and transient amblyopia. Since the time of Hypocrates, this train of symptoms, with many others which at times go with it, have been described by many writers both lay and medical: the former being chiefly persons who have been subject to attacks.

As to the pathology, Thos. M. Leszynsky, in the *Reference Handbook of the Medical Sciences*, Vol. IV, page 551, says: "The pathology is still obscure. The prevailing and most plausible theory is that the attacks are due to periodical discharges of nerve force originating in the cerebral cortex or in the sensory centers, involving principally the intracranial branches of the trigeminus and the pneumogastric nerves. According to a recent 'mechanical' theory, the attack is produced by an acute transient closure of the foramen of Munro and a consecutive swelling of the brain (Spitzer)."

The assigned causes of this disease have been as numerous as the remedies which have been given for the relief of its distressing symptoms. There can be no doubt, however, but that heredity plays a very important role. It is more commonly direct than in almost any other neurosis, and is more likely to be transmitted by or through the mother. Females are more frequently affected than males. It begins early in life, some cases as early as the fifth or sixth year. Church

and Peterson say that thirty per cent. of the cases begin between the fifth and tenth years of age. This is probably too high a percentage, but the majority of cases begin with puberty or shortly thereafter. Among the many causes of the attacks mentioned by writers in text-books, are indigestion and intestinal autotoxæmia, lithæmia, constipation, errors in diet, mental overwork, anxiety, excessive fatigue or exhaustion from any cause, menstruation, emotional excitement, dental caries, and naso-pharyngeal diseases. Eye-strain is also given as one of the so-called reflex causes, by many of the writers, but very few, if any of them, give it the attention which I think it should receive. Barthalow, A. A. Stevens, Taylor, Anders and Osler merely refer to it as a possible cause in some cases. H. C. Hood, in *Pepper's System of Practice*, gives it more space. In discussing migraine, he says: "Peripheral irritation, such as eye-strain, may greatly aggravate the disorder and must be carefully prevented." Church and Peterson say: "The cases beginning in early childhood very frequently follow the first systematic use of the eyes for near vision, as in school work. *Eye-strain*, arising from accommodative or muscular asthenopia, is certainly competent to excite migrainous attacks in those predisposed." Fuchs and Noyes make no mention of it. Chas. A. Oliver, in *Norris and Oliver's System of Diseases of the Eye*, says: "In many cases migraine has one of its main causes in ocular disturbance, and can frequently be benefitted by attention that is directed toward the visual apparatus." Myles Standish, in the same system, after mentioning causes which may precipitate an attack of migraine, says: "Last, but not least, ocular fatigue. There would seem to be no reason why attacks of migraine should not be precipitated by the same ocular strains that precipitate epileptic convulsions, but my experience leads me to think that refractive strain is a much more fruitful cause of attacks of migraine than abnormalities of the ocular muscles." De Schweinitz in discussing heterophoria gives, among the general symptoms, headache as the prominent one and says: "It may be a typical migraine." He seems to think muscular unbalance a much more common cause of migraine than ametropia. George M. Gould attaches very little importance to the heterophorias, but believes that

it is due to ametropia, especially the low degrees, and goes far in advance of other writers on the subject, holding that migraine in all its forms is caused by eye-strain. He reviews the medical literature on the subject and claims that it, as well as the writings of famous literateurs who have suffered with the disease, points to eye-strain as the cause, if we but read the symptoms aright.

I have, from the beginning of my career as oculist, made it a point to examine very carefully the refraction and muscular balance or unbalance of every case of migraine that came under my observation, with a view of discovering what could be accomplished towards its relief by correcting all abnormalities that might exist. From my records I select four cases which have been under observation for a period of years, and give them as illustrative cases to show that many cases of migraine may be cured or relieved by properly correcting the ametropia.

CASE I. A physician, age 35, consulted me in April, 1896, giving the following history: Father suffered from migraine until the age of fifty, when the attacks ceased. Mother has always suffered from it, and still does at the age of eighty. At about the age of ten he began having attacks of sick headache, at intervals of a week or two and lasting three or four days. The pain was more severe in the left temple, but involved the right, as well as the occiput. Nausea and vomiting always occurred.

Being a constant sufferer, and unable to pursue his studies with any comfort or satisfaction, and finding no relief from internal medication, he consulted an oculist in 1885, who prescribed a weak spherical, for reading, without benefit. In 1889 he consulted another oculist who prescribed —.75 D.C. ax. 105° for O.D. and —.25 D.C. ax. 75° for O.S., for constant use. These he wore from that time until he consulted me, with the result that he was able to use his eyes as much as he desired; his headaches occurred at intervals of months instead of weeks, and were much less severe. I found no change in his refraction, and advised him to continue wearing the same glasses.

$$V.O.D. = \frac{17}{50}, \text{ w. correction} = \frac{17}{15}$$

$$V.O.S. = \frac{17}{20}, \text{ w. correction} = \frac{17}{10}$$

In speaking to him a few days ago, he told me that he was still wearing the same glasses and that he had sick headache only occasionally.

CASE II. Mrs. X., age 57, consulted me Nov. 23, 1897, giving a history as follows: Began having a headache at the age of ten. Using eyes for sewing or study would bring on an attack of pains in forehead and eyes, with nausea and vomiting, usually lasting one day. At the age of forty-eight she began wearing glasses, and since then has had very little headache. She consulted me on account of a chronic purulent dacryocystitis on left side, of five years' standing, and a chronic catarrhal conjunctivitis of twelve years' duration, which became aggravated if she used her eyes for near work. No headache nor pain in eyes. Had been wearing the following glasses: O.D. +.75 D.S. \bigcirc +.25 D.C. ax. 90° , O.S. +.25 D.S. \bigcirc +.25 D.C. ax. 135° with +3. D.S. added for reading.

$$V.O.D. = \frac{17}{20} - , w. \text{ correction} = \frac{17}{15}$$

$$V.O.S. = \frac{17}{50} + , w. \text{ correction} = \frac{17}{15}$$

A test of the extrinsic muscles showed, adduction 18, abduction 13. Stevens phorometer showed an exophoria ranging from $5\frac{3}{4}^\circ$ to 7° .

Under treatment the dacryocystitis and the conjunctivitis improved, but every time she attempted to read for even a few minutes her left eye would get red and water. I then combined a $2\frac{1}{2}^\circ$ prism, base in, with the glasses she had been wearing, which gave her considerable relief; but after wearing them for several years and still not being able to use her left eye as much as she wished, without its getting red, I decided to tenotomize her left external rectus, repeated tests having convinced me that it was the muscle at fault. This was done in February, 1900. Immediately after the operation the phorometer showed an exophoria of $\frac{1}{2}^\circ$. Since that time she has occasional attacks of acute catarrhal conjunctivitis, but she can use her eyes as much as she cares to, without its producing the old symptoms in her left eye.

This case would seem to show that the ametropia and not the heterophoria was causing the migraine, inasmuch as it was relieved as soon as she began wearing the proper glasses.

CASE III. Miss X, age 32, a daughter of Case II, consulted me in June, 1898, giving this history: Began having

migraine at the age of seventeen. Using her eyes at near work always brought on an attack lasting from one-half to two days. Began wearing glasses at the age of nineteen, which gave her complete relief, provided she did not use her eyes too much. Six weeks before consulting me she had left off her glasses for an hour and a half which brought on a severe headache, since which time she had not been comfortable. Was wearing O.D.+1.12 D.S., O.S.+1.12 D.C. ax. 120°.

$$V.O.D.=^{17}_{15}, w.+1.25 D.S. \bigcirc + .75 D.C. ax. 90^{\circ}=^{17}_{15}$$

$$V.O.S.=^{17}_{40}, w.+ .75 D.S. \bigcirc + 1.50 D.C. ax. 110^{\circ}=^{17}_{15}$$

The muscle tests showed, adduction 31, abduction 9. The phorometer indicated orthophoria. I gave her the full correction, since which she has been able to use her eyes with comfort as much as she cares to, and has no sick headaches.

CASE IV. Miss X, age 22, a daughter of Case II, came to me April 20, 1899, giving a history as follows: Began having headache at the age of eight. At the age of fourteen the attacks became more frequent, and she has been a martyr to them ever since, always being worse in the spring. The pain was always on right side in one attack and on left side in next, alternating with absolute regularity. Distant and near vision good; could use her eyes as much as she liked, the use of them apparently having nothing to do with her headaches. Inasmuch as her eyes never ached, it did not occur to any of her physicians that they might be at the bottom of her trouble. She consulted one good physician after another who prescribed all sorts of medicines, climate, etc., without benefit. Her attacks of migraine were coming more and more frequently, practically making an invalid of her, when in despair she consulted me, thinking that perhaps her eyes might be the cause of her suffering, in spite of the fact that they never ached. I found

$$V.O.D.=^{17}_{15}+, w.+ .75 D.S. \bigcirc + .50 D.C. ax. 90^{\circ}=^{17}_{15}$$

$$V.O.S.=^{17}_{15}, w.+ .75 D.S. \bigcirc + .50 D.C. ax. 90^{\circ}=^{17}_{15}$$

Adduction 27, abduction 2. Phorometer showed $1\frac{1}{2}^{\circ}$ esophoria. A full correction was ordered for constant use, which relieved her headache completely for fourteen months, when they returned. She again consulted me, and I found

$$\text{V.O.D. w.} + 1.25 \text{ D.S.} = \frac{17}{15}$$

$$\text{V.O.S. w.} + .75 \text{ D.S.} \bigcirc + .50 \text{ D.C. ax. } 90^\circ = \frac{17}{15}$$

The refraction in O.S. being unchanged.

I gave her the full correction for O.D., which again completely relieved her until November, 1901, when she again reported having had occasional headaches for the last month. Her ametropia at this time seemed to require

$$\text{O.D.} + 1. \text{ D.S.} \bigcirc + .25 \text{ D.C. ax. } 15^\circ \text{ giving } \frac{19}{15} \text{ vision}$$

$$\text{O.S.} + .62 \text{ D.S.} \bigcirc + .37 \text{ D.C. ax. } 90^\circ \quad \frac{19}{15} \quad "$$

This correction again relieved her until January, 1904, when she reported having had several severe attacks at intervals of only a few days. Homatropine, which had been quite satisfactory in the past, was again used. The test indicated that the ametropia had not changed. Feeling that there must be some change that the homatropine had failed to indicate, I prescribed a 1 per cent. sol. of atropine to be used three times daily for three days. I then found

$$\text{O.D.} + 1.25 \text{ D.S.} \bigcirc + .50 \text{ D.C. ax. } 15^\circ = \frac{17}{15}$$

$$\text{O.S.} + 1.25 \text{ D.S.} \bigcirc + .25 \text{ D.C. ax. } 165^\circ = \frac{17}{15}$$

The full correction was ordered, which has given complete relief.

We thus have one case in which the careful correction of the ametropia gave decided relief, but did not cure. One case in which presbyopia with the correction of the ametropia gave entire relief. One case in which inability to use the eyes on account of pain in them, as well as the fact that they brought on the migraine, was relieved by correcting the ametropia. And one case in which the eyes never ached, where the migraine was completely relieved by correcting the ametropia, but where it promptly returned on the slightest change of the refraction.

ERRATA.—In the article "Bullous Keratitis," June number, 1904, page 171, read, Descemet's membrane was denuded of its endothelium, instead of "epithelium" as printed.

THE DETERIORATION OF VISION DURING SCHOOL LIFE.*

BY ETTIE SAYER, M.B., B.S.,

Assistant Medical Officer, Board of Education, London County Council.

THERE are nearly a million children attending the Board schools in London and such large numbers of these had obvious defects of vision that two years ago the Board decided thoroughly to investigate the condition of the children's eyesight. The children in our schools are divided into three departments:

1. Boys between 8 and 14 years of age.
2. Girls " 8 " 14 " " "
3. Infants " 4 " 8 of both sexes.

The work was carried out on purely scientific principles. A child was taken to have normal vision who distinguished objects subtending an angle of one minute, this being determined by the ability to recognize letters 9 millimetres square from a distance of six metres. Only children in the boys' and girls' departments were to be included in the test, and it may be briefly stated that 10 per cent. of boys and 11 per cent. of girls on an average throughout school life were found to have such serious defects of vision that their visual acuity was $\frac{6}{18}$ or worse.

In addition to this I last summer very carefully tested the visual acuity of 1,864 infants between 6 and 8 years old, 100 of each sex for every three months increase of age. With children younger than this it was impossible to get trustworthy results.

As a large number of these infants did not yet know their letters, the letter E was made in various sizes and positions to correspond with Snellen's test types, $\frac{6}{6}$, $\frac{6}{24}$, etc. The infant was placed six metres away, given a large E to hold, and told to turn it in the same direction as the one indicated—upwards, downwards, backwards or forwards—and rewarded with a sweet every time it got it the right way upon the first trial.

The results were very surprising, for it was found that at exactly six years of age 81 per cent. could read $\frac{6}{6}$ with each

* Paper read at the International Congress of School Hygiene at Nuremberg, 1904.

eye separately, and only 3.5 per cent. had such serious defects that they could only see $\frac{6}{15}$. The defects, however, steadily increased with every quarter of a year of age, until at 8 years old only 77 per cent. could see $\frac{6}{6}$ with each eye, whilst 8 per cent. had serious defects.

These results were so contrary to statistics published hitherto that Dr. Kerr, the Principal Medical Officer to the Board, suggested submitting a large number to re-examination by the ordinary methods, and he and I together went over them. It was now found that when tested with the ordinary Snellen's test types a much larger number apparently had bad vision, but with this method of E the vision of infants was as is stated above.

The reason for this difference I shall endeavor to prove is simply that the higher brain centers are as yet undeveloped, and that the methods hitherto employed for testing the eyesight of very young children have been at fault. Defective visual acuity, in short, has been confused with want of perception by the brain, and the serious defects among children aged 6 years are only 3 per cent., a percentage which steadily increases until at 11 years old it reaches 11 per cent., and then gets somewhat better again.

This great deterioration is extremely serious. The eye being the chief inlet for knowledge it means at least 25,000 children are being seriously handicapped in all their pursuits. The shortsighted child cannot see the blackboard, a ball in play comes suddenly out of nowhere, a human face is an expressionless patch, and, never seeing its expression, he grows up without any power of estimating character from observation. As he does not care to look at what he cannot see his chief delight is to pore over a book. This, as I shall show, only increases his defect of vision, and, moreover, since he sits all doubled up with his head bent low over the book, the movements of respiration are hampered, which predisposes him in after life to organic diseases of the heart and lungs.

Therefore, it is of the utmost importance to discover what is the cause of the deterioration of vision, and to prevent it or cure it as the case may be.

Normal Changes in the Eye from Birth to Old Age.—A normal eye is one in which the focal length of the lens at rest

is equal to the axial length of the eyeball posterior to the lens, and in which the retina is of normal structure and sensitiveness to receive the disturbances and vibrations of ether known as light. Given these conditions a perfect image is thrown on the retina from every object which is placed in front of it at a sufficient distance for rays of light from it to arrive on the front of the eye practically parallel. In order that correct images of near objects should be accurately focussed onto the retina the normal eye possesses three faculties: (1) Adaptation, (2) accommodation, (3) convergence. The intelligent appreciation and interpretation of things visible, however, is a function of the very highest order, necessitating not only that the eye should be perfect as an optical instrument, but in addition that the higher visual centers situated in the occipital cerebral cortex and elsewhere in the brain should be fully developed and in good physiological working order.

The changes which occur in the eye itself during life are chiefly concerned with accommodation which depends partly on muscular contraction and partly on the elasticity of the lens. If, therefore, that elasticity is diminished (as it is in old age) beyond a certain point, accommodation will fail. The eyeball in infancy is short or flat and hypermetropic, but the lens is relatively larger, more hemispherical, and much more elastic than it is in after life; therefore its amplitude of accommodation is greatest at birth—so much so that the shortness of the eyeball is then more than compensated. By about 11 years of age the eyeball has grown and elongated so as to be emmetropic—that is to say, the focal length of the lens equals the length of the posterior chamber. Throughout life the elastic tissue in the whole of the body gradually lessens, and the elastic tissue in the coats of the eyeball shrinks, causing it to become somewhat flatter again. The lens itself loses its elasticity most markedly and steadily, and with this loss the amplitude of accommodation gradually diminishes until by the age of 50 the normal eye is incapable of accommodating for objects nearer than 10 inches.

Changes during Life in the Visual Centers of the Brain.—The dissociation between the reception of visual impressions by the eye and the perception of them by the brain is a

matter of everyday experience. Who is there amongst us that has not at some time or other pulled out a watch, looked at it, and after replacing it in the pocket realized that the time had not been noticed? There is a distinct remembrance of the facepiece having been impressed upon the retina, but owing to the ultimate visual cerebral centers or the passages to these centers having been obstructed by thoughts or cerebration on other subjects the details of the facepiece of the watch passed unnoticed, and failed to arouse any consciousness of their significance.

Somnambulism is another familiar example of the cutting off of these higher from the lower centers. Here all actions are performed automatically, visual impressions being received and acted upon without the concurrence of conscious thought. The young infant, whose higher centers are only partially developed, will be unable to explain which letter is D and which is G and to give a name to them, but yet the eye may be capable of receiving a perfectly accurate visual impression, and by exercising the faculty of mimicry (which is developed extremely early and is present in several of the lower animals), it may copy the position of an E held up to it every time it receives the impression; especially will it do this if its sympathies are engaged by its being rewarded every time it gets the position right on the first trial.

The progress of the development of these higher centers is best watched by noticing the development of the fusion faculty—that psychical blending of the two sets of visual impressions when the two eyes act together as a pair which produces binocular vision. A newborn child fixes a light from a mirror flashed into its eye only momentarily, therefore the fixation must be purely reflex. In two or three weeks it fixes it for two or three seconds, but does not converge accurately. It is only by the fifth or sixth month that experiments with prisms show a distinct desire for binocular vision.

During the first few months want of control by the higher centers resulting in muscular incoördination causes the movements of the eyes to be uncertain, the slightest disturbance, even a flatulence, causing one or other eye to deviate. But by the end of the first year the desire for binocular vision is so strong that unless there is some insuperable obstacle the

vision of one eye will be suppressed in preference to enduring diplopia. Experiments with Worth's amblyoscope prove that this fusion faculty is not fully developed normally until the sixth or seventh year. Therefore the higher centers cannot be developed until then.

The Cause of the Rapid Deterioration of Vision During School Life.—At 6 years of age 3 per cent. have seriously bad vision, and 88 per cent. can see $\frac{6}{6}$ with each eye; at 11 years of age 11 per cent. have seriously bad vision, and only 58 per cent. see $\frac{6}{6}$ with each eye. The rest have slight defects.

In farming districts, where vocations demand no accurate vision, no necessity for care of the eyes arises; but if children from these communities are sent to school the problem of how to prevent injury to the eyes soon obtrudes itself by the appearance of headache, pain in the eyes, impaired vision, undue sensitiveness to light, and increased lachrimation. Examination reveals tonic cramp of accommodation and hyperæmia of the optic nerve, choroid and retina. These symptoms subside under rest and recur when work is resumed.

If accommodation and convergence are not sufficient to overcome the hypermetropia of infancy, the child brings its eyes very low down onto its work, as the larger retinal image and increased illumination more than compensate for the less accurate definition and the muscles of accommodation are strained to the utmost. A sustained and strenuous effort is demanded of all the ocular muscles. The continuous contraction of the internal recti renders them liable to overpower their antagonists and become a factor in the causation of squint. More important is the pull which the muscles of accommodation exert upon their points of insertion; they distort the eyeball and tend to lengthen it antero-posteriorly. This elongation produces myopia, which when caused in this way is more likely to attain a high degree and become ultimately perilous than when it existed as an original proportion. All recorded cases which have passed from hypermetropia to myopia have done so by astigmatism, no one having been emmetropic at any stage.

The small or hypermetropic eye is always found in animals, in infants, in uncivilized races, and in those who pass their lives in employments of the grosser sort, whilst myopia

is almost unknown under these conditions of life. It is with the greatest rarity that the adult Indian outgrows his hypermetropia. Unfortunately I did not take statistics, but, when doing a large practice amongst Kaffirs, I was never once consulted about short sight, or even asthenopia.

Myopia results only under the stress of those employments which require the protracted use of the eyes for near work. Half a century ago Professor Donders laid down the law that "the myopic eye is a diseased eye." Myopia increases steadily with the progress of pupils in school; it is the characteristic of the student or of the artisan who began accurate near work early in life. Among the compositors of Breslau, Cohn found that no less than 51 per cent. had myopia. Risley found the same great percentage among the compositors and brass-founders of Philadelphia. Among the students in various German universities Cohn found 22 per cent. to 28 per cent. were myopes. Erisman showed that among 1,245 myopic children in St. Petersburg, only 5 per cent. were free from pathological conditions of the choroid. Horner kept 1,875 myopes under observation, and no less than 34 per cent. developed the greatest complications later on, such as hæmorrhages into, or detachment of, the retina, optic atrophy, etc.

Indications for Treatment.—A child compelled to struggle with a sign is negligent of the thing signified. Its nervous energies cannot be directed into two channels at the same time. Therefore if its senses are defective it cannot take the full advantage of its education.

The public duty of providing an education which is to be the preparation for the child's afterlife should include the duty of ascertaining whether that education is likely to inflict serious and permanent physical injury upon it.

It is only reasonable to expect some degree of physical deterioration will result from depriving the child of its freedom and confining it to lessons, and since the eye is the organ upon which the greatest strain falls, it will be the eye which is most likely to suffer.

All eyes should be tested immediately on the child beginning its education: (1) As to visual acuity; (2) as to rapidity of perception; (3) as to color blindness.

All children whose visual acuity is subnormal should be atropined at once, and if there is any excessive degree of hypermetropia simple *plus* lenses should be worn until, it is outgrown. Spectacles for them should be regarded not as an evil, but as a temporary protection against the evil of defective vision.

With regard to commencing myopia, it is very questionable whether the child should be allowed to continue its studies at all. Certainly no more near work should be done than is absolutely necessary. A special curriculum should be devised for these children which will fit them for a genial career in after life and not involve any strain on the eyes.

Children with errors of refraction always get as near to their work as possible. The hypermetrope, to get a larger image; the myope, to get any image at all—spectacles may do away with the necessity, but the objectionable habit may be formed. The thing to do is to use a face rest which will keep the face at least 10 inches off the book.

Squint occurs when there is an error of refraction combined with a defect in the “fusion faculty.” I have found it present in 4.5 per cent. of children under 8 years of age. It is of the utmost importance to cure squint with the greatest speed as early as possible. Before the child is 6 years old it is easy to do so by correcting the refraction and training the fusion faculty with Worth’s amblyoscope. After this it is a matter of considerable difficulty. Only 30 per cent. of squints can be cured by glasses alone, the rest requiring operative treatment, etc. Squinting eyes become amblyopic from continued suppression of vision to prevent diplopia.

Color sense is as often untrained as absent, therefore attempts should be made to develop it.

The Type of Children’s Books.—It has already been most ably pointed out by Dr. Kerr that pens, pencils, paper, etc., are utterly out of place in an infant’s school. They are much too minute. Infants should only be allowed to chalk on cardboard. Reading should be learned from the blackboard. Every child in a 6-year-old class should be able to print its name in 6-inch letters on the blackboard with a free arm. Fine writing should be absolutely forbidden. In order to be distinguished, the letters must subtend an angle

of at least 5 minutes, and the lines of which they are composed at least 1 minute. This requires the utmost endeavor of an emmetrope, being the limit of normal acuity of vision. Therefore it is obvious that a hypermetropic infant should not be set to small print. At no time during school life should type smaller than pica be used.

Parents among the lower orders are so astoundingly ignorant with regard to the care of their children's eyesight, that it is impossible to rely on them to get defects attended to. They invariably imagine the child will in time "grow out of" any defect. Glasses they regard as a disfigurement worse than sore eyes, or else as an adornment for Sundays. Many children also run grave risks by their parents taking them to sight-testing establishments, certified opticians, etc., who are rightly prevented by law from using atropine, and who therefore prescribe wrong glasses.

CONCLUSION.

No child's eyes were intended by Nature to undergo the strain of accommodating over lessons for six or seven hours every day of their lives between 4 to 14 years of age.

If, however, compulsory education enforces it, it becomes the duty of the Board of Education annually to separate those 20,000 children or more whose vision is so defective that they are unfit physically, to devise for them a specially modified curriculum, and to provide them with glasses if their parents are too poor or too ignorant to do so. This is the type of case, common enough, I am referring to:

Boy, aged 13; rest of his class I examined yesterday, but he was absent, as he stopped at home to help his mother (who is a widow with five younger children) do the washing. He suffers from headaches, squints, sees double, and has blepharitis. His class is at present doing algebra, a subject in which he makes no progress, as sometimes the figures are all a blur and at others they jump about.

Such children are as unfit to become students as cripples are to become soldiers.

There is plenty of skilled manual work to be done by the class which is so poor that the public has to pay for their education, and they should be taught from their earliest infancy to regard this as their special lot in life.

For if the child with defective vision has its weak eyes overstrained, not only does he as an individual suffer, but also future generations, to whom the welfare of the nation is to be entrusted, it being a well-proved fact that there is no defect more likely to be transmitted from parent to child than that of defective eyesight.

ON SYMPATHETIC AMBLYOPIA.*

BY PROF. NUEL.

LIÈGE.

Translated by Adolf Alt, M.D.

AT this period the Academy is especially concerned in traumatic neuroses. * * It is therefore not out of the way for me to speak to you about an eye affection which is kin to the traumatic neuroses. I mean the sympathetic amblyopia, the clinical features of which I have described in 1897.† I may be the more allowed to recur to this affection as it is far from being admitted by all authors.

Ocular and visual troubles make quite frequently an important part of the symptoms of traumatic neuroses, partly as such and partly because their careful study is one of the best means to control the patient's veracity.

The visual symptoms in a traumatic neurosis consist chiefly of a marked diminution of the visual acuity, in a moderate diminution of the visual field and in the rapid fatigue of the eye. Moreover, they are bilateral and symmetrical.

The symptoms of the sympathetic amblyopia, as we shall see, consist nearly solely of those of the traumatic neuroses. It attacks an eye whose fellow has been lost by an injury; we might, therefore, look upon it as a traumatic neurosis.

On the other hand the sympathetic amblyopia shows a certain relationship with the true sympathetic ophthalmia.

When we described this affection we especially dwelled upon this likeness. Our first communication was based on the prolonged observation of sixteen cases. We still observe some of these cases. Since then we have seen another half dozen of such cases, four of which we have been able to

* Bulletin de l'académie royale de Médecine de Belgique.

† De l'amblyopie sympathétique, Arch. d'opht., March, 1897.

follow up very closely. Thus we are enabled to control our former work and revise it if necessary.

We said, *the disease is sympathetic*, in the sense that one eye becomes diseased *because* its fellow has been injured.

Period of the beginning of the affection.—The true sympathetic ophthalmia begins most frequently one or two months after the injury to the sympathizing eye. Our amblyopia appears very frequently at a later date.

Initial symptoms.—At first there is amblyopia without any ophthalmic symptoms. Usually the patient for months complains of momentary obscurations of vision, which come on especially when he wants to use his eyes. The visual acuity is slightly diminished and, perhaps, even now a small narrowing of the visual field may be found. Sometimes there is slight photophobia. The patient may also complain of photopsiæ, even with pain. Most frequently there are vague pains in the forehead and temples.

After a prolonged rest these symptoms may disappear. Yet, a cure takes a long time, and the affection is of a serious nature.

In the presence of such symptoms, especially when the visual field is not much narrowed, the physician can not help suspecting simulation, especially if it concerns a working man who is insured against accidents. We may add that the final course of the disease allows this suspicion to linger for a long time in the mind of the physician.

Symptoms of the confirmed affection.—Meanwhile, after many alternating improvements and relapses the affections become more grave. The visual acuity falls to $\frac{1}{5}$, $\frac{1}{12}$ and less, in exceptional cases so low that fingers can hardly be counted at 1 metre. Then the visual field is always notably circularly reduced* to 15° or even 10° , and the color sense is defective also.

Meanwhile, the ophthalmoscopic appearance of the fundus is normal. Later on, especially when the amblyopia attains a marked degree, we see sometimes: (*a*) a slight papillary trouble (neuritis?); (*b*) a distinct pallor of the temporal half of the papilla, almost like that due to alcohol and tobacco poisoning; (*c*) rarely a certain degree of perivasculitis in the

* We do not insist here on the effective precautions to prevent an eventual simulation of a reduced visual field.

papilla; (*d*) sometimes a slight dilatation of the retinal veins. In the beginning, the pupillary reaction to light is usually normal. Later on, the pupil is slightly dilated and reacts sluggishly.

Thus the affection may go on for months and years with alternating improvements and aggravations. We have in rare cases seen it disappear altogether, not even leaving a defect in vision behind. After years the condition may become stationary with a more or less pronounced amblyopia. We have never seen total blindness resulting from it.

We have lately seen the cases 2, 5 and 6 of our former report of 1897. These patients are virtually unchanged.

As new observations, we will relate the following ones taken from a half dozen which we have encountered since 1897. [Here follow four typical cases.]

These cases absolutely confirm the clinical picture which we have given in 1897 of the sympathetic amblyopia. The first one is one in which the injured eye was not opened. The third is an example of a great and definite reduction in visual acuity. Finally, the fourth is an example of a cure with absolute restoration of visual acuity.

Acute forms of sympathetic amblyopia.—A moderate degree of photophobia is often seen in the commoner forms of this disease, as we have described them before. Just now we are observing with Dr. Rutten a case which, perhaps, belongs to the category of diseases which we have seen, but which is peculiar on account of the intense photophobia and persistent photopsiæ. It seems that we have here a more acute form of sympathetic amblyopia.

W. P., miner, on Dec. 26th, 1902, had one eye injured by coal dust. A purulent keratitis resulted in keratomalacia and loss of nearly the whole of the cornea. Panophthalmitis threatened. The enucleation of this eye resulted in prolonged cessation of all pathologic symptoms. March 20th, suddenly grave symptoms appeared. Severe amblyopia; fingers at 1½ metres only. Violent photophobia and painful photopsiæ with headache. I saw the patient for the first time at this stage. In spite of the photophobia I succeeded with an ophthalmoscopic examination; the eye was emmetropic and the fundus normal. The visual field was reduced, especially outward and downward. By means of rest in the dark, smoked

glasses and bromide of potassium, the excitement of the eye cooled down, but very slowly. The visual acuity rose in three months to $\frac{5}{30}$. Since then the patient could do some light surface work. A month later complete relapse. He had to stop all work. Till to-day these improvements and relapses have alternated. Just now he has a very violent relapse. The photophobia forbids an ophthalmoscopic examination, even with cocaine instillations. Photopsiæ are constant; the headache is very severe, with remissions. The visual field seems intact; of course, a not too excessive contracted field might remain unnoticed on account of the extreme photophobia with blepharospasm. The visual acuity is only $\frac{1}{12}$ of normal.

This affection is very like the common forms of sympathetic amblyopia, except that both photophobia and photopsiæ are of extreme severity. We might, therefore, consider it as an acute form of sympathetic amblyopia. On the other hand, by the violence of its symptoms and the nervous excitement it comes rather near certain forms of traumatic neurosis. We prefer not to give a final opinion. Whatever their cause, these are exceptional cases, and infinitely more rare than the cases previously described.

Compared with true sympathetic ophthalmia, this amblyopia develops much later, mostly months, sometimes a year after the injury.

Condition of the sympathizing eye.—In most cases, if it has not been enucleated, the injured eye shows no symptoms of irritation; it is mostly a “quiet” eye. Some were atrophic, others, although seeing a little, showed a grave affection of the optic nerve (neuritis). The visual field was reduced, and the eye was becoming amaurotic. Several of these eyes had never been perforated and showed no signs of infection. Some of these sympathizing eyes had recently been enucleated.

Prognosis.—In general the prognosis is benign, in that the affection does not lead to total blindness. Yet it is one of the gravest affections on account of its long duration with its many improvements and relapses. The working capacity of such patient is frequently forever annihilated. In the beginning the visual acuity may be comparatively good, but the obscurations produced by the application of the eyes prohibit serious work, and especially continued work. If

after a real improvement work is resumed, a relapse soon makes its appearance.

Diagnosis.—This is easy enough, but is not definite until after a prolonged observation of the patient. * * * *

Treatment.—The great remedy in these cases is rest and smoked glasses. Mercurial inunctions seem favorable. We do not believe that enucleation is of as fortunate results as it is in the classic sympathetic ophthalmia of the authors.

Pathogenesis.—The whole process and symptomatology of these cases speaks against microbic nature, while the sympathetic iridocyclitis and neuroretinitis have altogether the character of microbic diseases.

But is this really a sympathetic affection? Since now-a-days we can no longer doubt the microbic nature of sympathetic ophthalmia, there is a tendency to exclude this amblyopia from the class of sympathetic diseases. More than one author is tempted to reject it as a traumatic neurosis. It would then be a traumatic neurosis of one eye, provoked by an injury to its fellow.

The traumatic neurosis has a broad back. Since its real nature is unknown, we enter under this head a multitude of heterogenous affections, just as every diminution of vision without known cause is called an amblyopia. * * * *
The fact that this disease is counted among the two clinical categories as undetermined, as the "traumatic neurosis" and the "amblyopiae," shows us that we know nothing as regards its pathogenesis and pathological physiology.

The traumatic neurosis, independent of its traumatic origin, is generally characterized, (1) by there being no gross anatomical lesion, and (2) by a certain diffusion of symptoms, that is, that the localizations vary in the same individual.

In this direction our affection is distinct from the neuroses. There is, in fact, a fixation of symptoms, and, then, in the cases of old lesions we find little pronounced, it is true, but nevertheless quite real changes in the optic papilla. Therefore, the affection belongs rather to the amblyopias.

We have still to prove the sympathetic character. Those who most protest against this adjective, do so because of a certain theory which they form for themselves concerning sympathetic affections in general. But this is a rather illogical procedure. An affection is called sympathetic because

the fellow eye has been injured and when the injury has not at the same time exerted any influence on the eye secondarily diseased. What goes beyond this definition is hypothetical. If we apply this criterion to our affection, it surely deserves the name of "sympathetic." Yet, we acknowledge on the whole that at present this question is as yet not definitely settled.

In our ignorance of the pathogenesis of sympathetic amblyopia we have risked the following hypothesis, or, if it pleases better, the following theory.

It is a frequent observation that the sympathizing eye suffers to a larger or smaller degree from a neuritis caused by a hyperplasia of the interstitial tissues (neuroglia, etc.) of the optic nerve of the sympathizing eye, which hyperplasia leads to sclerosis of the nerve.* This sclerosis in most cases does not reach beyond the optic foramen. But could it not under certain circumstances reach the chiasma and produce atrophy of the optic nerve fibers? In the chiasma the fibers of the two nerves are most intimately interwoven. And, if the sclerosis of the nerve of the injured eye should reach it, it must compress the fibers of the fellow eye and injure them more or less. It will be conceded that the general progress and the symptoms of the disease agree perfectly with this hypothesis.

But let us stop on the road of suppositions, as plausible as they may seem. Our principal object is to have sketched the clinical appearance and reality of a grave affection of vision which interests most seriously the laborer as well as the responsibility of the employer in case of an accident during work. Whatever may be the nature of the pathological process, which further investigation will surely make clear, we hope to have established, against all protests, the reality of the clinical entity to which we have given the name of sympathetic amblyopia, and the practical importance of which is evident. And this is true, even if later our hypothesis of the pathogenesis of the affection should prove erroneous, even if it should be found that this affection must be held separate from the sympathetic ophthalmias and be counted one of the traumatic neuroses.

* See our paper entitled "On the neuroglia in optic neuritis," *Bull. de l'académie de médecine de Belgique*, v. xiv, 1900.

MEDICAL SOCIETIES.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.*

JOHN TWEEDY, F.R.C.S., President, in the Chair.

Thursday, June 9th. 1904.

PRIMARY OPTIC ATROPHY DUE TO LEAD.

Mr. SIMEON SNELL (Sheffield) related a case occurring in a boy aged 16. The sight had commenced to fail for rather more than a year before the patient was first seen in October, 1903, and had rapidly become worse during the past three months. The vision was: right, $\frac{2}{60}$; and left, $\frac{1}{60}$; both optic papillæ were white and atrophic but did not suggest preceding neuritis. The family and personal history were good. For two or three years the boy had worked as a file cutter, which exposed him to the influence of lead, and he had the ordinary symptoms of lead poisoning. The optic atrophy was, in Mr. Snell's opinion, due to this cause, and all other causes had been eliminated. Mr. Snell, after mentioning a similar case, stated that among file cutters he had observed several instances in which the optic nerves were affected either directly by the lead or in association with kidney or brain disease.

OPTIC ATROPHY AFTER POST-PARTUM HEMORRHAGE.

Mr. SNELL related the following case, in a lady, aged 28, who was seen last February a few days after recovery from puerperal mania. Both papillæ were atrophied but there was no evidence of past neuritis. There was no perception of light, and the pupils were dilated and motionless. On October 3rd, 1903, she was delivered of her first child at full term, but an hour afterwards she had considerable hemorrhage, and although the amount lost was not very great yet she had never seemed to have really recovered from it. It was doubtful when the failure of sight had commenced, but it had been suspected for some time. She had probably not

*British Medical Journal.

seen at all for two months. There was no albumen nor throughout the pregnancy anything to suggest kidney disease. Mr. Snell referred to a previous case he had seen in which the sight was greatly affected by the same cause, and he also alluded to cases collected by Chevallereau.

OPTIC GLIOMA.

The following case was narrated by Mr. SNELL: In a baby, aged 1 year and 10 months, first seen on April 1st, 1897, glioma of the retina was diagnosed. One eye was excised on April 7th, and the tumor found to be confined to the globe, but was rather large. On January 7th, 1899, the child was again seen with a similar condition in the other eye. This was excised on March 1st, and at the present time the child was alive and well. Mr. Snell referred to the small number of cases in which both eyes had been removed for glioma without a fatal result. Other cases related were as follow: A girl, aged 4½ months, was sent to Mr. Snell on December 18th, 1903, with glioma of the right eye; the eye was removed on December 22nd, and the growth found to be confined to the globe, which it nearly filled; there was no recurrence. Another member of the same family had suffered from glioma of both eyes, which had proved fatal, the parents having refused to allow the removal of both eyes; there was one other child between these two who was alive and healthy. Mr. Snell mentioned that until recently no instances had been published in which glioma had occurred in more than one member of the same family. Up to the present time three observers, besides himself, had recorded cases.

The President, Mr. Stanford Morton, and Mr. Devereux Marshall mentioned cases they had had of glioma bearing on the points brought forward by Mr. Snell.

ON MICROPHTHALMOS.

Mr. STEPHEN MAYOU gave a lantern demonstration of the anatomy of three cases of microphthalmos which he had examined.

CARD SPECIMENS.

Card specimens were shown by Dr. Louis Werner, Messrs. E. E. Henderson, G. W. Roll, E. W. Brewerton and Dr. D. Rayner Batten.

AMERICAN OPHTHALMOLOGICAL SOCIETY.

*Program of the Fortieth Annual Meeting held on the 13th and 14th of July,
at Atlantic City, N. J.*

1. Case of tuberculous tumor of the fundus-oculi. Dr. T. R. Pooley.

2. Intra-ocular tuberculosis with report of two cases. Dr. W. C. Posey.

3. An intra-ocular tumor containing hyaline cartilage. Dr. A. N. Alling.

4. A malignant tumor of the pars ciliaris retinae (neuro-teratoma) of a nature hitherto unrecognized. Dr. F. H. Verhoeff (by invitation).

5. Sympathetic neuro-retinitis and serous uveitis following enucleation and implantation of glass globe. Removal of glass globe—resection of optic nerve—recovery. Dr. Rob't. Sattler.

6. A severe case of uveitis treated with radium. Dr. C. H. Williams.

7. Operations on the eyeball in the presence of an infected conjunctival sac. Dr. C. S. Bull.

8. The bacteriological diagnosis of the diphtheria bacillus, especially in conjunctivitis. Dr. Arnold Knapp.

9. Histological examinations in a case of ophthalmia nodosa. Drs. G. E. de Schweinitz and E. A. Shumway.

10. Report of a case of symmetrical enlargement of both lacrimal and parotid glands (Miculicz disease), associated with iritis, possibly tubercular in nature. Dr. C. W. Cutler.

11. A case of mind-blindness, unique in that the entire mesial surface of both occipital lobes and both optic radiations were preserved. Dr. W. A. Holden.

12. The blending of color impressions in the cerebral visual centers. Dr. C. H. Williams.

13. Report of a case of ophthalmoplegia externa totalis, complete recovery. Dr. W. E. Lambert.

14. Latent hypermetropia as a cause of eye-strain. Dr. L. S. Dixon.

15. Prism exercises — their indications and technique. Dr. A. Duane.

16. Test types for the reading distance. Dr. C. H. Williams.

17. The pathologic results of dextrocularity and sinistro-cularity. Dr. G. M. Gould.
18. On the muscle of Horner and the operation for advancement of the caruncle. Dr. L. Howe.
19. A case of cystadenoma of the lachrymal gland (with photograph). Dr. Edw. Stieren.
20. Report of cases of glaucoma treated by sympathectomy. Dr. C. W. Cutler.
21. Retro-bulbar neuritis. Dr. J. A. Andrews.
22. Traumatic emphysema of the lids. Dr. H. D. Hansell.
23. On the act of winking—its photographic measurements (with demonstration), and diagnostic value in paresis of the motor-oculi. Dr. L. Howe.
24. Case of foreign body in the eye 13 years, producing irritation, localized by Dr. Sweet's method, and removed. Dr. W. B. Marple.
25. Unusual case of persistent pupillary membrane, with illustration. Dr. W. B. Marple.
26. Concerning certain non-traumatic perforations of the macula lutea. Dr. G. E. de Schweinitz.
27. Cataract extraction as performed after method of Angelucci of Palermo by fixation of superior rectus and without aid of assistant. Dr. R. Sattler.
28. The importance of testing the ocular muscle-balance for near as well as for distance. Dr. S. Theobald.

ABSTRACTS OF THE PAPERS ON THE PROGRAM SO FAR AS
FURNISHED.

Latent Hypermetropia as a cause of Eye-strain, Dr. Dixon.

Eye-strain traced to ciliary muscle. Strain comes not from ordinary demands, but from constant action. This necessary on account of variations from emmetropia. Chiefly H. the only error that can elude instruments and methods in use. Can cause eye-strain even in small degree. Other factors, condition nervous system and amount of close work. Rest, the condition of safety. Original habit of sight prevents relaxation. This habit very obstinate and insidious. Error to suppose that good vision is final test of proper correction; that present relief is successful treatment; that the use of glasses for *close* work is the most important; that if vision is good, eye-strain is absent. Objections to full cor-

rection from patient's side and oculist's side. Safety and surety of the method.

The Bacteriological Diagnosis of the Diphtheria Bacillus, Especially in Conjunctivitis, Dr. A. Knapp.

Similarity of the diphtheria bacillus to closely-allied non-virulent organisms, such as xerosis bacillus. Differentiation only by animal experiment. A new method of differentiation by fermentation tests. Practical bearing in conjunctival diseases.

Prism Exercises, their Indications and Technique, Dr. A. Duane.

Method used by author in practicing with prisms, base out and base in. Supplementary convergence exercises. Three-fold use of prism exercises—(a) to combat muscular anomaly, (b) to modify the effect of an operation on the muscles, (c) to combat weakness or spasm of accommodation. Routine of practice in different kinds of exophoria and in esophoria. Necessity of frequent supervision and modification of the practice.

Case of Tuberculous Tumor of the Fundus Oculi, Dr. Pooley.

In an eye enucleated for absolute glaucoma was found a tumor which proved to be of tuberculous origin, patient showing no other sign of tubercular disease. (Microscopic specimen and microscopic slides will be shown.)

Certain Non-Traumatic Perforations of the Macula Lutea, Dr. de Schweinitz.

Certain lesions of macula of elderly persons, mostly having arterio-sclerosis, are compared with the lesions known as traumatic perforations. Similar lesions following iritis are described, and etiology discussed—viz.: hæmorrhage, degeneration of ganglion cells, alterations in capillaries, etc.

Case of Terato-Neuroma, Dr. Verhoeff.

(1) From the unpigmented epithelium of the pars ciliaris retinae there may rarely arise a tumor composed of embryonic elements which retain in a remarkable degree the arrangement of an embryonic retina in various stages of development.

(2) This tumor is malignant, but in how high a degree is uncertain.

(3) It is the only retinal tumor in which neuroglia has

been demonstrated to form an integral part, but nevertheless it is not a glioma.

(4) It is not to be confounded with the small benign epithelial growths that have sometimes been described as adenomata of the ciliary body.

(5) On account of its complexity of structure, its high differentiation, and its nervous origin, this tumor is properly designated as a terato-neuroma.

(6) The so-called glioma retinae, while differing from this tumor in many important respects, is yet of the same nature, in so far as both tumors are composed of embryonic retinal elements. The chief difference between the terato-neuroma of the pars ciliaris retinae, and the neuroma malignum of the pars optica retinae, lies in the fact that the latter represents throughout a less typical though higher retinal development than is anywhere reached by the former.

(To be illustrated with lantern slides.)

Ophthalmia Nodosa, Drs. Schweinitz and Shumway.

The patient was a negress, aged 15, whose conjunctival lesions appeared in August and who came under observation in September, when they presented on the bulbar conjunctiva of the right eye an appearance closely simulating in its clinical aspect tuberculosis of this membrane. An excised nodule implanted in the anterior chamber of a rabbit yielded negative results. Histologically the lesion was found to be due to the development of a number of tubercles as the result of the implantation in the conjunctiva of caterpillar hairs. The histological appearances of the condition prescribed are elaborately detailed and the literature of the subject briefly reviewed.

On the Act of Winking—its Photographic Measurements, etc., Dr. Lucien Howe.

1. The method of making the measurements. (a) The head rest. (b) Source of light. (c) Camera.

4. The results shown in (a) closing of lids. (b) Time during which the lids are closed. (c) The opening of the lids.

3. The practical application of such data in cases (a) of incipient ptosis. (b) of imperfect action of other muscles supplied by the third nerve.

On the Muscle of Horner and the Operation for Advancement of the Caruncle, Dr. L. Howe.

1st, The discovery of the muscle by Dr. Horner of Philadelphia. 2d, Illustrations of the fibers passing to the puncta. 3d, Of the fibers to the caruncle. 4th, Function of these two fibers respectively. 5th, How the caruncular fibers cause retraction after tenotomy of the internal rectus. 6th, How that retraction can be obviated.

Cystadenoma of the Lacrimal Gland, Dr. Stieren.

Man, age 42. Swelling in outer upper portion right orbit of six months duration; marked ptosis. Enucleated a tumor measuring 32 mm. in length, 18 mm. greatest diameter, 12 mm. thickest portion. A large cavity in center of tumor containing yellow, gelatinous fluid; numerous smaller cavities throughout entire mass. Microscopical examination, typical adenoma. No recurrence three and a half months later.

Photograph and photomicrograph.

A Congenital Intraocular Tumor Containing Cartilage, Dr. A. N. Alling.

Presentation of the eye of a child four years old, containing tumor which apparently springs from the root of the iris and ciliary body. Principal mass lies in the vitreous chamber. Also extension into the anterior chamber. The tumor consists of small spindle and branching cells and some probably epithelial in character. There is an area of hyaline cartilage in the center.

Traumatic Emphysema of the Lids, Dr. Hansell.

Division of the subject into emphysema complicating fracture of the bones of the face, and emphysema without fracture.

Relative frequency of emphysema as compared with the published reports of cases of the affection. History of two new cases. Diagnosis by crepitation and treatment by pressure.

Cataract Extraction after Method of Angelucci, Dr. Sattler.

Brief account of personal observations and experience with Prof. Angelucci's (Palermo) method of extraction of cataract with and without iridectomy. Fixation of tendon of superior rectus muscle without aid of speculum or assistant throughout operation.

A Case of Mind-Blindness, Dr. Holden.

Man, 53. Post hemiplegia, dementia, aphasia and apraxia, disturbance of vision; at times apparent blindness. Pupils reacted promptly. Optic nerves normal. Autopsy ten months later. Middle cerebral artery plugged on either side and large area of softening in angular gyrus and neighboring parts in either hemisphere—parts supposed to include the higher cortical visual centers—optic nerves normal. Mesial surface of occipital lobes containing lower cortical visual centers and optic radiations were preserved. In case of mind-blindness previously reported, optic radiations have been affected. In this case the higher cortical visual centers alone were involved.

THE AMERICAN ACADEMY OF OPHTHALMOLOGY
AND OTO-LARYNGOLOGY.

Ninth Annual Meeting, Denver, Col., August 24-25-26, 1904.

PRELIMINARY PROGRAM.

OPHTHALMIC SECTION.

President's address—"Education for Ophthalmic Practice." Dr. Edward Jackson.

"Samuel Sharp: the First Surgeon to Make the Corneal Incision for Cataract Extraction with a Knife." Dr. Alvin A. Hubbell, Buffalo, N. Y.

"Central Superficial Choroiditis." Dr. T. B. Schneideman, Philadelphia.

"Metallic Foreign Bodies Within the Eyeball and Their Removal; Being a Clinical Account of Twenty-Six Operations of that Character." Dr. Geo. E. de Schweinitz, Philadelphia.

"Remarks Concerning Some Parts of the Technique of Mules' Operation, the Handling of Thiersch Grafts and the Advancement of the Recti Muscles." Dr. John E. Weeks, New York.

"Lantern Demonstration on Glioma and the Question of Rosettes." Dr. A. Alt, St. Louis, Mo.

"Further Experience and Treatment of Keratoconus." Dr. J. A. L. Bradfield, La Crosse, Wis.

"Removal from the Lacrimal Duct, a Style Which Had Been Buried Seven Years—Almost Fatal Hæmorrhage." Dr. J. C. Buckwalter, St. Louis, Mo.

"The Toxic Amblyopias, with Special Reference to Those Produced by Tobacco and Coffee." Dr. A. E. Bulson, jr., Ft. Wayne, Ind.

„The Use of Pure Nitric Acid in the Treatment of Diseases of the Eye." Dr. J. W. Bullard, Pawnee City, Neb.

"Cases of Retinitis Pigmentosa." Dr. J. Elliott Colburn, Chicago.

"Remarks on the Need for Thorough Aseptic and Antiseptic Work Prior to, During and After Cutting Operations on the Eyeball." Dr. B. E. Fryer, Kansas City, Mo.

"The Safest Operation for Senile Cataract." Dr. H. Gifford, Omaha, Neb.

"Some of the Accidents and Complications Met With in the Extraction of Cataract." Dr. D. W. Greene, Dayton, O.

"Changes in Refraction." Dr. O. A. Griffin, Ann Arbor, Mich.

"Notes on the Use of Dionin." Dr. Thos. C. Hood, Indianapolis, Ind.

"A Case of Unilateral Nystagmus, with Remarks on the Probable Cause." Dr. S. Kirkpatrick, Selma, Ala.

"Some Unique Cases of Amblyopia." Dr. T. W. Moore, Huntington, W. Va.

"Removal of Anterior Capsule and the Hypodermatic Use of Morphia in Simple Extraction." Dr. Eugene Smith, Detroit, Mich.

"A Criticism on the Use and Abuse of Lacrimal Probes." Dr. G. F. Suker, Chicago, Ill.

"How Shall we Educate Our Blind Children?" Dr. Casey A. Wood, Chicago, Ill.

EDITORIAL NOTICE.

We wish to draw our readers' attention to *Ophthalmology* a new Quarterly Journal, owned, edited and published in the interests of the medical profession, the initial number of which will appear October 1, 1904. Yearly subscription \$5.00.

As its title indicates, it will be an ophthalmic periodical of about 250 pages, devoting about one-third of each issue to original essays, the balance to abstracts of original articles appearing in domestic and foreign literature, also complete book reviews.

H. V. Würdeman, M.D.

Managing Editor and Publisher.

Nelson M. Black, M.D.,

Assistant Editor.

Milwaukee, Wis.

THE AMERICAN JOURNAL OF OPHTHALMOLOGY.

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No. 8.

ORIGINAL ARTICLES.

APPEARANCES SIMULATING OPTIC NEURITIS DUE TO UNSUSPECTED IRREGULAR CORNEAL ASTIGMIA.

By SWAN M. BURNETT, M.D., Ph.D.,

WASHINGTON, D. C.

ON the 14th of February, 1904, Miss H., aged 24, was brought to me by a professional friend of another city. She had been under his care at various times for several years, but for her present trouble he had not treated her. She had, however, been under the treatment of another oculist for many months for what was diagnosticated as "optic neuritis" of the left eye, which had been first noticed after a very severe illness, during which there had been much violent vomiting. It was on recovery from this illness, she claims, that she noticed for the first time a loss of visual acuteness in the left eye, with a horizontal streakiness of letters. There was at no time any considerable pain or redness of the eye. She remembers, however, that there was an inflammation of this eye after measles in infancy. For this "inflammation of the optic nerve" she was treated vigorously, and electricity was applied for a considerable period, but, the patient thinks, with no perceptible result. In fact the state of vision has remained about the same since she first noticed it.

We examined the eye cursorily together. The media were

magnifier it was not possible to detect the slightest opacity of either lens or cornea.

An examination by the ophthalmometer, however, at once revealed the character of the trouble. While the corneal reflection of the mires was quite regular when the fixation was directly in front, as soon as it was turned slightly outward it was at once greatly changed in size and shape. This confirmed the suspicion I had as to an irregular refraction, and located it in the anterior corneal curvature. A systematic measurement of the corneal curve was then entered upon according to the method I had used in making such measurements of a number of corneæ in 1892, the results of which were published in the *Trans. Amer. Ophth. Soc.* for that year.¹

It was thus discovered that the corneal curve became suddenly very much flattened to the nasal side, dropping in fact from 27 at the visual axis to 24 within the first 5°, to 21 at 10°, to 19 at 15°, and 16 at 20°, a total of 11 D. This is shown diagrammatically in Fig. 1, where the refraction in ophthalmometric readings is indicated for every 5° from the visual axis to the periphery, as far as 20°, for the horizontal, vertical and two intermediate meridians. The measurements also show an inverse corneal astigmatism of 1 D.

The shadow test was unsatisfactory on account of the "internal shadows," always found in any form of irregular astigmatism,² but there was demonstrated a simple myopic astigmatism of approximately 1 D. against the rule.

No spherical or cylindrical glasses gave any material improvement of vision or relief from "streakiness" of the letters. With a stenopaic hole, however, her vision rose at once to $\frac{5}{6}$, and all the blurring and streaks across the letters disappeared. With a stenopaic slit vision was best when it stood obliquely from above outward, downward and inward, that is corresponding to the meridian of most nearly normal curve, and was $\frac{5}{6}$ — not quite so good as with the hole.

The form under which irregular corneal astigmatism usually manifests itself is that due to alterations in structure from ulcerations or inflammatory changes. Outside of typical conical cornea it is rare to find abnormal irregularity in curvature of any considerable degree with preservation of trans-

parency. One such case I reported at the meeting of the section of ophthalmology, American Medical Association, 1900.³ This, however, might be properly regarded as a modified form of keratoconus, as the anomaly consisted of a marked flattening of the upper half, and a bulging of the lower half, of the cornea.

In the case now rereported, the defective curvature is limited principally to the nasal and upper quadrant, though the lower nasal quadrant participates somewhat. The remaining portion of the corneal curve does not depart in any considerable degree from what might be considered the normal, in the light of the measurements of 42 eyes reported in the article above referred to.

It will be seen from an examination of the diagram that the refraction to the nasal side falls suddenly within 5° of the visual axis from 27 to 24, and at 10° to 21, a total of 6 D within the space of a medium sized pupil. Through such a surface it is surprising that vision was as good as it was found to be, and the blurring of objects and streakiness are easily accounted for. This irregular astigmatic state also explains the parallactic movements and blurred aspect of the vessels seen by the ophthalmoscope. It likewise offers an explanation of the diagnosis of "optic neuritis" rendered by a competent oculist on the basis of the indistinctness in outline of the vessels in the vicinity of the disc.

It is possible of course, that at the time of the serious illness from which the patient suffered, there may have been a neuro-retinitis, but when our examination was made there was nothing to suggest such a pathologic state, except the blurred vision and the indistinctness of the retinal vessels under the ophthalmoscope and a possible pallor of the optic disc. The fact, however, that the stenopic hole brought vision to practically normal demonstrates that the reduced visual acuteness was not due to a nerve lesion, but to an optical defect in the form of an irregular corneal astigmatism.

A further lesson to be learned from this case is the necessity of a careful ophthalmometric measurement of the various meridians for at least 10° from the line of the visual axis whenever, with perfectly transparent media, there is a diminished visual acuteness with the phenomena of "streakiness"

or irregular blurring of the test letters that cannot be accounted for by any of the ordinary demonstrable pathologic causes.

As to the etiology of the abnormal corneal curve, I am unable to offer any satisfactory explanation. It is difficult to connect it with the illness after which her attention was first directed to the visual phenomena. It seems more likely to be congenital and to have been first discovered at that time.

¹The General Form of the Cornea and its Relation to the Refraction of the Eye and Visual Acuteness.

²See article by the author on Some Incidental Phenomena of the Shadow Test, Trans. Amer. Ophth. Soc., 1892.

³The Optical Treatment of Keratoconus.

ATROPINE VERSUS ESERINE IN GLAUCOMA.

BY W. H. SEARLES, A.M., M.D.

OSHKOSH, WIS.

IN the May number of the AMERICAN JOURNAL OF OPHTHALMOLOGY I published an article showing the successful use of atropine in glaucoma and claiming for it pre-eminence over all other drugs in the local treatment of this disease.

There is no fact in the world of mind or matter that is inconsistent with any other fact, and it is the purpose of this article to show that there is no antagonism between atropine and eserine as regards glaucoma. It is universally accepted that eserine is anti-glaucomatous, and this is not denied by the writer, but he does place it far below atropine.

The one is a myotic and the other a mydriatic, and upon these opposing conditions the theory has become firmly established that the one being anti-glaucomatous the other must be directly the opposite. How, then, is it possible to give atropine any place in the treatment of glaucoma?

It seems to be necessary at this point to show the steps in the evolution by which a different conclusion was reached than now generally obtains as regards atropine in glaucoma.

The writer, early in his practice, had a lady client past 64 years of age who came to him for a change of lenses which a distinguished oculist had recently fitted. It was a case of

rapid progressing presbyopia with chronic conjunctivitis and a possible tendency towards glaucoma.

The treatment was, no further change of the lenses; no near work; smoked glasses to be worn; and medical treatment of the eyes. Among other things atropine was used. The case progressed satisfactorily for ten days, when suddenly the patient was attacked with acute inflammatory glaucoma in both eyes. Assisted by an eminent oculist, a double iridectomy was promptly performed, but without success. She became totally blind for the rest of her life.

Was atropine responsible for this accident? I think it would be so held to-day by any court of experts; but not by the writer.

Who can give a satisfactory reply to the inquiry, Why did this case progress safely for ten days? If the explanation is correct that atropine induces glaucoma by thickening the iris base and consequent obstruction of the iris angle, it should have done so at once. This unanswered inquiry was the first step in the evolution.

A year later another case of atropine glaucoma came under his care in a woman past 50 years of age. She was a victim of chronic trachoma in both eyes and totally blind in one eye from this disease. Vision in the other eye was greatly impaired from a central nebula. Some doctor had given her a solution of atropine for dilating the pupil, which enabled her to see somewhat better. Suddenly she was attacked with glaucoma. I saw the case several days later. She still had some vision, and I advised an immediate operation, which was declined. I then gave her medical treatment as follows: Fl. extr. jaborandi with stimulants, as she was greatly prostrated by pain and want of sleep. This was to be followed by morphia in an hour. She got a good sleep, the first in several days, and awoke in every way improved. Quinine was given during the day and the jaborandi and morphia repeated at night. She made a complete recovery in a few days and has remained well ever since.

It appears that if atropine can induce glaucoma, that jaborandi and morphia can cure it. This is the second step. How did it do it, and would it have succeeded in my previous case?

"Sleep is nature's sweet restorer." It is also a mydriatic. Jaborandi and morphia are myotics. DeWecker says morphia does assist atropine, even though it is a myotic. Jaborandi and morphia as myotics, both together cannot overcome the mydriasis of atropine.

Did this patient get well without regarding either atropine or the doctor? I began to explore this jungle of contradictions and I found that she had used the atropine steadily and was still using it when I first saw her, and that no precaution had been taken against using the eye.

I now saw for the first time that the atropine was possibly not the immediate cause of the glaucoma, but that it was antecedent only, through the intervening of accommodative effort.

The jaborandi and morphia was able to relax the muscle strain and at the same time stimulate the absorbent channels to remove the excess of fluid in the eye, when pain and tension ceased, followed by sleep. How else can it be explained? Sleep will not follow morphia alone in these cases, but it often will jaborandi alone.

The writer found, nearly twenty years ago, by trials upon completed glaucomas that jaborandi would reduce tension. He now conducted a series of observations, extending over three months, upon a case of total loss of vision in both eyes due to malignant glaucoma with highest tension, but in which no secondary degeneration had as yet occurred.

Jaborandi was given regularly once a day, from 15 to 40 drops at bed time. One eye only was allowed to be treated locally. At the end all increase of tension had disappeared from both eyes! and the pupils responded to light tests, showing that the oculo-motor center had been reached. Atropine and eserine were both given prolonged trials, and the fact was established so far as this case was concerned, that it made no difference, as regards tension, whether atropine or eserine was used. The limits of this article will not permit a detailed statement of the work in this case. One thing was certain, there was a complete absence of all accommodative effort. Was that the reason it made no difference whether the pupil was dilated or contracted? It was not a long jump in the dark to frame this into a theory: That the

accommodation must always be reckoned with, whenever atropine is used, without regarding age or condition. This is another step in the evolution.

Let us see if it applies to the first above case. It appears that my client went to bed with no intimation of eye trouble, but in the night a member of the family was taken ill and she was up the rest of the night, when she was attacked with glaucoma before morning. Here was a severe strain upon the ciliary muscle for several hours, while the eyes were paralyzed by atropine. Was that fair, either to atropine or the doctor? Atropine is now perfectly safe in the practice of the writer to use in the presence of any form of glaucoma, providing the muscle is held in abeyance. His client would not have been attacked if she had strictly obeyed instructions to avoid all use of the eyes for near work. Furthermore, the glaucoma to-day would now be quickly suppressed by the writer and vision restored through medical treatment alone. This is sustained by his clinical experience. Atropine is to this muscle what splints are to a fracture, and we should no more use the one than the other while under such control. No one has ever charged atropine with causing strain or spasm, and yet the writer finds that the glaucoma charged to atropine is due wholly to strain or spasm induced by the patient.

It is this that overfills the uveal tract with blood and precipitates the glaucoma. Priestly Smith says: "High tension depends more upon an excess of blood in the uveal tract than upon an excess of intra-ocular fluids." The writer now treats any glaucoma supposed to be caused by atropine by a further exhibition of atropine aided by cocaine and, internally, by jaborandi and morphia. It is the logical answer, for we have no force comparable to atropine with which to subdue ciliary strain or spasm. Best of all, it succeeds, and hence disposes of the theory that atropine can produce glaucoma.

The iris holds a subordinate position in every glaucomatous process. The final effect of atropine upon the eye is to contract the blood vessels of the uveal tract, and hence, among other things, must reduce volume, secretion and tension. The supposed thickening of the iris periphery under atropine is then not tenable, and the glaucoma that follows

must be charged to some other cause. Atropine, then, is never responsible for increase of tension. It is a contradiction of the definition of the action of atropine to say it can be. If, then, it is not material whether a drug is a mydriatic or myotic as regards glaucoma, the whole mystery is cleared away and eserine at once is seen to range itself by the side of atropine. Eserine is anti-glaucomatous only, because in some important points it agrees with atropine. DeWecker says: "Eserine contracts the whole vascular system of the eye and diminishes secretion." Snellen says "it contracts the uveal tract in toto." Priestly Smith says, "it can reduce the turgid ciliary processes so that everything returns to its previous condition." He assists eserine by adding cocaine, "because of its invaluable power in glaucoma of contracting the ciliary bloodvessels and diminishing the sensibility of the ciliary nerves." And yet cocaine is a mydriatic. What may we expect when cocaine is brought to the side of atropine as its natural corollary in facing glaucoma? The writer will not here discuss this phase of the subject more than to say, it renders atropine invincible.

Eserine also reduces volume and tension and pain. The writer has not proven it, but he suspects that eserine is not responsible for spasm of the muscle any more than atropine. The principle of myosis and mydriasis simply must be set aside in the treatment of glaucoma.

The argument that myosis draws the iris away from the angle is not important, because in doing this it obstructs the stream channel at the pupil center and hence must force the iris forward in any event. Eserine is, then, anti-glaucomatous without regarding myosis, and so also is atropine without regarding mydriasis. But if either one holds any advantage over the other it must be mydriasis, because in complete dilatation it removes, for the time being, one side of the iris angle as completely as the best possible iridectomy, and better still, it does it throughout the entire circle.

Glaucoma has at last met the force that is able to subdue it. It is an old familiar one under new conditions. In the hands of the writer, after twenty years of research and practice, it has become a "live wire" and easily does the work. It outranks iridectomy.

MEDICAL SOCIETIES.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.*

At a meeting of this Society held on Friday, July 8th, JOHN TWEEDY, F.R.C.S., president, in the chair, Mr. GEORGE COATES gave a lantern demonstration of the pathology of thrombosis of the central vein of the retina. He showed preparations from five cases. In four of these an organized thrombus was found in the central vein; in three of them complete obliteration of the vein in a portion of its course had occurred from this cause, and in one of them the manner of re-establishment of the lumen by the accession of collaterals from the trabeculæ of the nerve was well shown. In the fourth case canalization of the thrombus and not obliteration had occurred. In the fifth no thrombus was found, probably because the optic nerve was cut longitudinally in the usual manner, and not transversely, as was desirable when a lesion of the central vessel was suspected. He also dealt with the changes found in the retinal vessels of these cases—namely, (1) endothelial proliferation, (2) thickening of the connective tissue of the walls, (3) hyaline degeneration (a change superimposed on the last), (4) secondary thrombosis. Various combinations of these changes might be found both in arteries and veins. The use of Weigerts elastic tissue stain in researches on vessels was also illustrated.—Dr. H. KNAPP (New York) made remarks on the clinical aspect of thrombosis of the retinal vein.—Card specimens were shown by Mr. Marcus Gunn, Dr. Rayner Batten and Mr. Smyth.

*British Medical Journal.

THE AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY.

NINTH ANNUAL MEETING, DENVER COLO.,

AUG. 24-25-26, 1904.

ABSTRACTS OF PAPERS TO BE READ AS FURNISHED TO THE SECRETARY.

The Report of Two Cases of Laryngeal Tuberculosis Operated on by Thyrotomy; Comments on the Operation. Dr. Otto J. Stein, Chicago.

Abstract: History of the two cases operated on by the author. A review of the cases reported in literature. The purpose of presenting the report of these two cases. Indications for the operation. The advantages and disadvantages. Dangers and complications.

The Medical Treatment of Laryngeal Tuberculosis, with Special Reference to the Use of Formalin. Dr. L. B. Lockard, Denver.

Abstract: In the treatment of laryngeal tuberculosis in its manifold types no remedy has such a broad field of usefulness as formalin, for it fulfills in varying measure every essential indication. In ulcerative lesions is usually superior to lactic acid, combining cleansing, bactericidal and stimulating, without irritative properties. Strong solutions reduce hyperplastic tissues, producing brilliant results in the vegetative types. It is also efficient in general infiltrations. Usually produces some anaesthesia. In severe cases daily applications of a 3 to 10 per cent. solution, with a spray $\frac{1}{2}$ per cent. every four hours, is advised. Results depend largely upon maintaining continuous action. Other remedies may supplement, but should rarely supplant it.

The Prognosis of Laryngeal Tuberculosis. Dr. Robert Levy, Denver.

Abstract: The crusade against a hopeless prognosis in all cases of laryngeal tuberculosis is going on. On the other hand, there is a decided fear of too much optimism, which is due to limited experience or imperfect diagnosis. The prognosis "means not merely a recognition of the name of the disease, but a knowledge of the nature of the disease, still incomplete, but rapidly gaining in fullness and accuracy." (Dock.) The prognosis of laryngeal tuberculosis must be considered in its relation to pulmonary tuberculosis. It has a bearing upon the pulmonary complication, while the pulmonary disease also influences the progress of the laryngeal affection. Involvement of the larynx in tuberculosis results in an interference with two important functions, namely, phonation and deglutition. Its prognosis should be considered with reference to these two functions, and also with reference to the life of the patient. The nature of the lesion in the larynx, its early recognition, the time of its development, in the course of pulmonary or other tubercular invasion, and the environment of the patient, in which climate plays an important part, must all be considered in determining the progress and ultimate result of the affection.

How Shall We Educate Our Blind Children? Dr. Casey A. Wood, Chicago.

Abstract: The chief objects sought in the education of the blind are to make them self-supporting and to enable them to realize health and happiness. The institutional care of blind children, as ordinarily carried out in our asylums, has many drawbacks. Intermarriage among the blind and restricting their daily social intercourse to persons similarly affected are among these evils. The experiment of educating blind children in the public schools has for the first time been tried in Chicago, and has proved decidedly successful. Blind pupils attend classes just the same as children with good vision, and are taught and treated, as far as possible, like the latter. Supplementary teaching is also given them in certain schools. This department of the Chicago public school system is under the care of a very competent superintendent, who is himself totally blind. An account of the methods employed and their

results. Individual examples. Conclusions from this experiment in pedagogy.

Hæmorrhage from the Lacrimal Duct Following Removal of a Style. Dr. J. C. Buckwalter, St. Louis.

Abstract: Report of case. Interesting to note how long the style lay dormant. Up to within two months of the time of removal the style had caused no symptoms of irritation. On removal the hæmorrhage was profuse and prolonged, apparently not influenced by any anti-hæmorrhagic treatment. Considering the fact that there are no bloodvessels of any consequence in this region, aside from numerous minute arteries and veins, it is remarkable to have serious hæmorrhage.

A Criticism on the Use and Abuse of Lacrimal Probes. Dr. G. F. Suker, Chicago.

Abstract: A condemnation of the very large lacrimal probe. The very conservative employment of any lacrimal probe is deemed sufficient.

George Frick's Book: The First American Treatise on Ophthalmology. Dr. J. M. Ball, St. Louis.

Abstract: This paper gives an account of the life and writings of George Frick, M.D., of Baltimore, Md., whose treatise, published in 1823, was the first ophthalmologic textbook issued in North America. A copy of the book will be exhibited.

Thursday—9:30 A. M.

DEMONSTRATION OF CASES, SPECIMENS OR INSTRUMENTS.

10 A. M.

Some of the Accidents and Complications Met With in the Extraction of Cataract. Dr. D. W. Greene, Dayton, O.

Abstract: A brief review of the history of the operation, showing the evolution through which the different steps have passed, from Petit, 1706, Daviel, 1745, to the present time. The shifting of the section forward until it is now made entirely corneal. The smaller iridectomy or its entire omission. The different method of opening the capsule and delivering the lens and cortical debris. The so-called toilette of the operation. Combined operation usually made. What are

accidents in and what are complications of the operation. A strict definition of each is difficult. Management of a normal case. Management of accidents and complications. Accidents are usually operative. Complications may be present at the time of operation; may result from accidents during operation, but as a rule are post-operative. Age as such is never a contra-indication. Physical and mental conditions incident to it may be complications. When anaesthetics are used. When anterior leaf of capsule is extracted. When lens is extracted within the capsule. Flannel bandages, lint and cotton compresses. Confinement in bed not rigidly enforced after second day. All of which is intended to lead up to and make clear the title of the paper and the subject treated under it.

Removal of Anterior Capsule and the Hypodermic Use of Morphia in Simple Extraction. Dr. Eugene Smith, Detroit.

Abstract: Extraction of large central portion of anterior capsule with properly constructed capsule forceps is superior to use of cystotome. In more than 90 per cent. of cases it obviates necessity for discission of capsule, which is not always a harmless procedure. Many times in cases of thickened capsule the lens may be delivered in the capsule and without loss of vitreous. Ideal method in case of Morgagnian cataract. Hypodermic use of morphia contracts pupil; allays distress following operation; also alleviates tendency to cough, if present.

The Safest Operation for Senile Cataract. Dr. H. Gifford, Omaha.

Abstract: 1. Discussion of advisability of iridectomy, simultaneous or preparatory. 2. The advantages and disadvantages of a conjunctival flap. 3. Operations with large detached conjunctival flap, including Czermack's subconjunctival operation.

Complications Following Cataract Extraction in Glaucoma. Dr. Louis J. Goux, Detroit.

Abstract: Cataract due to glaucoma. Report of case. Difficulties encountered in extraction; lens delivered by intra-ocular pressure. Sequela. Post-operative hemorrhage.

corneal fistula. What prophylactic measure would have been advisable?

Central Superficial Choroiditis. Dr. T. B. Schneideman, Philadelphia.

Abstract: Lesions of the deeper membranes of the eye, objectively appreciable with the ophthalmoscope and not of specific origin, rarely recovering without serious damage to structure and function; the case here reported proves a fortunate exception. A central scotoma, at first with hardly appreciable edema of the macula, presently showed yellowish plaques of choroiditis. A complication, perhaps with some casual relation, was discovered in a purulent discharge from sphenoidal sinuses on both sides. The case terminated in practically perfect recovery.

Lantern Demonstration on Glioma and the Question of Rosettes. Dr. A. Alt, St. Louis.

Abstract: Since Wintersteiner has first drawn particular attention to certain appearances in glioma, well known before, given them the name of rosettes, and claimed them as due to neuro-epithelial cells, and, in accordance with this, has proposed to call certain gliomata neuro-epitheliomata, further critical studies regarding these points have been but few. Very similar formations are often found in detached and firmly compressed retinae, but they are not the same thing. Rosettes or similar figures can be formed whenever and wherever glioma cells grow around another tissue or cell, and their presence or absence does not seem to prove that there are several distinct forms of glioma.

A New Series of Semaphore Charts for Testing Vision of Railroad Employees. Designed by Nelson M. Black, M.D., of Milwaukee. Dr. H. V. Würdemann, Milwaukee.

Abstract: The author makes no claim of originality, but uses the figure of a semaphor signal, pole and all, accurately reduced by scale to represent at twenty feet the actual signal seen at one-half mile (2,640 feet). The colors used are the same as are used in actual practice, and the background is a grayish tinge to represent the average horizon, against which signals with an ideal background are seen. Both the semaphore and the Hall or disc signals are represented.

Thursday—3 P. M.

Some Unique Cases of Amblyopia. Dr. T. W. Moore, Huntington, W. Va.

Abstract: Three cases of amblyopia occurring in apparently healthy children between the ages of ten and seventeen years; one case treated by the method recommended by L. Webster Fox. Some points of difference between these cases and hysterical amblyopes. Two cases of hysterical amblyopia possessing interesting features.

The Toxic Amblyopias, with Special Reference to those Produced by Tobacco and Coffee. Dr. A. E. Bulson; jr., Ft. Wayne, Ind.

Abstract: References to coffee amblyopia but few and brief in ophthalmological literature. Visual disturbances not uncommon in persons who drink coffee to excess, and trouble corrected in some by abandoning use of coffee, while in others active treatment is required to restore function. Concentric contraction of the visual fields for all colors, usually with, but sometimes without, marked impairment of central vision, the most conspicuous manifestation. Persistent central scotomas, not observed. Asthenopic symptoms and scintillating scotomas not uncommon. Aside from slight paleness of the temporal half of the disc in two cases there were no fundus changes noted by ophthalmoscopic examination in the cases under observation. Casey Wood's theory, that many of the toxic amblyopias are due to the production of ptomaine poisoning by the particular toxic agent taken into the system, is thought to be a reasonable explanation of the occasion of coffee amblyopia. Reports of cases. One case observed through two relapses. Another marked case seemed to be produced by the combined effect of tobacco and coffee, but did not improve until the use of coffee was abandoned. Permanent atrophic changes would probably result in long continued cases. In recent cases prognosis good. Treatment the same as for other toxic amblyopias. Elimination essential. Strychnine brings about early improvement of central vision and widening of vision fields.

Cases of Retinitis Pigmentosa. Dr. J. Elliott Colburn, Chicago.

Abstract: Predisposing cause not known. Exciting causes: Consanguinity, hereditary or acquired syphilis, and certain toxins, either generated in the digestive track or introduced in the form of xanthin, or xanthin-producing ingesta. The prognosis is not necessarily unfavorable in toxic form. Report of eight cases. One of consanguinity, two hereditary syphilis, two general sclerosis, three with local sclerosis (?), coffee and tea toxæmia. Treatment: Dietetic, eliminative and stimulating.

Remarks on the Need for Thorough Aseptic and Antiseptic Work Prior to, During and After Cutting Operations on the Eyeball. Dr. B. E. Fryer, Kansas City, Mo.

Abstract: The paper proposes to very concisely set forth the need for a greater effort to obtain an aseptic condition of the conjunctiva and its surroundings previous to eye operations; to call attention to some of the main factors required for successful working towards this objective; moreover, to show that those who are inclined to doubt the possibility of an eye asepsis are in error; also to point out the most approved methods.

The Use of Pure Nitric Acid in the Treatment of Diseases of the Eye. Dr. J. W. Bullard, Pawnee City, Neb.

Abstract: Very little has been written on the subject. Is one of the most powerful escharotics in the mineral acid group, but as it coagulates the albumen of the tissues without redissolving it, it in this way safeguards its own excessive action. In the great majority of cases its action is just as effectual as is the actual cautery, over which it possesses many advantages, both to the surgeon and patient. Mode of application. Its use is indicated in all infected ulcers of the cornea and conjunctiva. In fact, may be used in any case where a cauterant is indicated. Possesses advantages over both carbolic acid and iodine. Is very serviceable in the obliteration of chronic vascular conditions of the cornea, and in the after treatment of the pterygium operations.

Some Experiences with Adrenalin Chloride. Dr. D. E. Welsh, Grand Rapids, Mich.

Abstract: Danger arising from the hypodermic use of chloride of adrenalin in chloroform anæsthesia.

Notes on the Use of Dionin. Dr. Thos. C. Hood, Indianapolis.

Abstract: 1. Statement as to the drug itself, chemical name and composition. 2. Short résumé of reports on it by those who have used it, with the rationale of its action and physiological effect. 3. Notes of its use in cases of my own. 4. Conclusions.

Experiments with Radium in Some Nose, Throat and Ear Diseases. Dr. J. C. Beck, Chicago.

Abstract: General consideration of "Radiotherapy." What is radium? Scientific experiments and tests of radium. Its therapeutic uses. Five cardinal questions answered by letter from a number of physicians using radium. Clinical experiments by means of radium in: 1. Carcinoma of the larynx; 2. Tuberculosis of the larynx; 3. Sarcoma of the nose (intranasal); 4. Tuberculosis (primary) of the septum; 5. Specific ozena; 6. Intranasal neuralgia (marked); 7. Tinnitus aurium (marked); 8. Chronic suppuration of the middle ear; 9. Lingua nigra. Comparative experiments of radium and X-rays. Conclusions.

Friday—9:30 A. M.

DEMONSTRATION OF CASES, SPECIMENS OR INSTRUMENTS.

Dr. H. V. Würdemann, of Milwaukee, will exhibit photographs and specimens of tumors of the eye and orbit.

SYMPOSIUM ON NON-SUPPURATIVE OTITIS MEDIA.

1. The Etiology and Diagnosis of Acute Non-Suppurative Otitis Media. Dr. W. C. Bane, Denver.

Abstract: Etiology: Exposure to cold or wet when body is overheated; in children during teething; extension of pharyngitis to the ear; complication of measles; fluids entering the middle ear through the Eustachian tube. Diagnosis: A feeling of heat and fullness in the ear; pain, at

first intermitting; dullness of hearing; membrana tympani congested and later bulging, discharge of serum and mucus.

2. The Treatment of Acute Non-Suppurative Otitis Media. Dr. E. Pynchon, Chicago.

Abstract: The ideal treatment in the early stage of acute otitis media is the prompt use of the intratympanic air douche. Inflation in this condition has been both praised and condemned by different writers, though all appreciate the fact that a cure can be promptly effected by the re-establishment of tympanic drainage and restoration of atmospheric equilibrium. Politzerization, when strong enough to pass the tubal occlusion, is painful, and has carried into the tympanum infective material from the tubal orifice so as to intensify the inflammatory process in the middle ear. In order to abort an acute catarrhal otitis the writer has for several years successfully supplied the constant air current, suitably medicated, with a catheter, beginning with low pressure and gradually increased as required. As an air douche it cleans the Eustachian tube of infective material and eventually passes the constriction. In addition to the air douche, hot 1 per cent. phenol douches are used, several times daily, in the external auditory canal, and during the interval dry heat, preferably with a Japanese hot box. Lastly, if resolution does not follow, then a paracentesis is required. In addition to these steps, general treatment is given as indicated.

3. The Diagnosis and Differentiation of Chronic Non-Suppurative Otitis Media. Dr. W. L. Ballenger, Chicago.

Abstract: 1. Acute catarrhal otitis media: *a.* Acute suppurative otitis media; *b.* Acute tubal catarrh; *c.* Acute myringitis; *d.* Foreign body in the external meatus; *e.* Traumatism through the external meatus; *f.* Ear-ache from the presence of adenoids.

2. Chronic catarrhal otitis media vs.: *a.* Adhesive otitis media; *b.* Oto-sclerosis spongifying; *c.* Labyrinthitis; *d.* Pressure on auditory nerve; *e.* Impacted cerumen.

3. Adhesive otitis media vs.: *a.* Chronic catarrhal otitis media; *b.* Adhesive obstruction of Eustachian tube; *c.* Oto-sclerosis; *d.* Labyrinthine diseases.

4. Oto-sclerosis vs.: *a.* Adhesive catarrhal otitis media;

b. Otitis media catarrhalis chronica; *c.* Tubal catarrh and adhesive obstructions; *d.* Labyrinthine diseases.

4. The Treatment of Chronic Non-Suppurative Otitis Media. Dr. M. A. Goldstein, St. Louis.

Abstract: Three empirical subdivisions of the stages and development of chronic non-suppurative otitis media may be made.

1. The early stages of hypertrophic catarrhal otitis media.
2. Advanced stages of hypertrophic catarrhal otitis media.
3. Sclerosis and rarefaction of the bony capsule of the labyrinth.

The treatment of these several subdivisions of chronic non-suppurative otitis media will be given consideration under their respective heads:

1. *Early Stages of Hypertrophic Catarrhal Otitis Media.*—The swollen condition of the mucous membrane and exudation cause stenosis of Eustachian tube and retraction of membrana tympani. For relief, use Politzer bag or catheter, repeating daily or as frequently as improvement in hearing and decrease of feeling of fullness in ear indicate. When exudation is profuse in tympanic cavity, incision of membrane may be necessary to drain. As nasal and post-nasal mucosa are usually provoking factors, they should receive careful attention. The alkaline nasal spray, saline irrigation, post-nasal wash, astringent applications to pharyngeal mouth of Eustachian tube, vaporization with inflation and adrenalin applications should be used. If adenoids or hypertrophied faucial tonsils are present, they should be removed. Hypertrophied turbinates or septal deflections or projections, if interfering with proper aeration of Eustachian canal, or exciting constant irritation to mucosa or erectile tissue, should be disposed of. If general condition is below par, tonics and systemic medication are indicated. Climatic conditions may often influence the progress of these cases. Prompt attention to these many features of the early stages of chronic catarrhal otitis media offers favorable prognosis.

2. *Treatment of Advanced Stages of Chronic Catarrhal Otitis Media.*—Under this subdivision we include long-standing plastic exudation and adhesions in the tympanic cavity.

with retraction of membrana tympani and fixation of ossicles. The Politzer bag and catheter are especially indicated. Where narrowing of Eustachian tube has occurred, the whale bone bougie and the gold electrolytic bougie have frequently been effective. Recent fixation of ossicles and slight adhesions may be broken up by repeated massage either with a hand masseur or an electric massage pump. Recently, vibratory massage has been introduced. The massacon, an ingenious form of vibratory pheno-massage, has been presented. Operative treatment, such as tenotomy of the tensor tympani and excision of ossicles in ankylosis have been frequently tried and have failed. Inflation of medicated nebulae are of benefit. Injections through the Eustachian catheter into the tympanic cavity are effective in many cases. Mild solutions of iodine, menthol and pilocarpine are used; iodine and menthol in an oily menstruum give best results. Internal therapeutics in this stage are of little value. Climatic conditions may influence progress and prognosis of this stage, as well as in the earlier stage.

3. *Treatment of Sclerosis* —In a definitely diagnosed case of sclerosis, all treatment has thus far been found useless. Too much emphasis cannot be laid on the necessity of a careful differentiation between the hypertrophic and the sclerotic form of otitis media chronica catarrhalis. The Bezold Ton-Reihe should be employed in the differentiation tests. The patient should be honestly informed that his case offers but little hope of improvement.

5. The Prognosis of Chronic Non-Suppurative Otitis Media. Dr. J. A. Stucky, Lexington, Ky.

Abstract: Accuracy of prognosis depends upon accuracy of diagnosis. The element of uncertainty in both. Prognosis depends on the type of the case, age, occupation; dyscrasia and heredity have to be considered in connection with local and systemic conditions. Evidence of improvement and success in handling these cases increasing in last few years. Danger of over-treatment. Brief comments on treatment now chiefly used, with suggestions.

What Constitutes Proper Nasal Treatment for Ear Diseases. Dr. Jno. A. Donovan, Butte, Mont.

Abstract: Uniformity in theory but not in practice.

Always negative pressure in naso-pharynx in proportion to nasal obstruction, increased greatly by unfavorable conditions; produces rarefaction in canals and collapsed ear-drums; turgescient membranes prolong the rarefaction and increase symptoms till chronic trouble results. Every nose already producing pathologic symptoms in ears should be made practically anatomically perfect. Every spur removed, but membrane preserved. Septum straightened, U incision, both ends of incision carried up entirely through the cartilage to the skin; splints injurious. Enough middle turbinate removed to relieve obstruction: edge of lower turbinate with saw and scissors. Mechanical saw, burr or trephine shortens and simplifies operations. Many advantages in immediate operation; active after-treatment not necessary; plugging contra-indicated. Immediate thorough operative treatment advisable, remembering always it is a person, not simply an organ we are dealing with.

Turbinectomy. Dr. D. S. Reynolds, Louisville, Ky.

Abstract: An efficient means of relieving obstructions due to malformations of the septum. It often relieves the distressing symptoms due to adenoid vegetations in the vault of the pharynx. In many cases it relieves deafness, by taking away the obstruction at the inferior extremity of the Eustachian tube. The operation should be as complete as possible, and is followed by no disturbance of the lacrimal apparatus. It allows not only the free passage of air through the nose, but affords drainage to the crypts and sinuses above. It should be done in all cases of nasal polypus.

Friday—3 P. M.

The Tympano-Mastoid Operation in Chronic Suppurative Otitis Media. Dr. A. H. Andrews, Chicago.

Abstract: Clinically there are two classes of cases, surgical and non-surgical. Early differential diagnosis is desirable but not always possible. Objects of the operation: 1. Removal of diseased tissue; 2. To provide for free and permanent drainage; 3. Improvement in hearing when possible. Dangers of the operation: 1. To the facial nerve; 2. To the semicircular canal; 3. To the lateral sinus; 4. To the middle fossa; 5. Accidental removal of stapes; 6. Con-

cussion from use of chisel and mallet. Cadaver experience necessary for thoroughness and safety. Instruments required. Methods of operating. A tongue-shaped flap made from skin of posterior superior wall of auditory canal is held in place by suture. Immediate closure of post-auricular incision. An enlarged auditory meatus facilitates after-treatment and lessens danger of future complications. Care necessary in the after-treatment to secure good hearing and to prevent exuberant granulations interfering with the healing process.

Keratosis of the Throat. (Illustrated.) Dr. Hal. Foster, Kansas City, Mo.

Abstract: The etiology: Where does it exist? The spores will be discussed. Pathology: The bacteria and stains. Symptoms: Local only: general health not affected; Diagnosis: Photographs will be presented: the spores may extend into the larynx, but as a rule are confined to the pharynx, lingual or faucial tonsils. Prognosis: good. But exceedingly annoying to nervous patients; should be corrected. Treatment: medical and surgical; antiseptics; applications; use of curette and galvano-cautery.

Ordinary Tonsillotomy, With Exhibition of New Instruments. Dr. E. Pynchon, Chicago.

Abstract: The tonsil is often semi-submerged, or so attached to the pillars that a partial separation is required before removal. For years the most popular tonsillotomes have been either the Mathieu or the Mackenzie types, the former pulling the tonsil out from its bed, while the latter, by pressure upon the pillars, is intended to attain the same result. I wish to present a new tonsillotome of the Mackenzie type, in which the handle is in straight line with the blade, and so shaped that it can be used equally well with either hand, and strong pressure applied, while the tonsil is being pulled through its fenestra by a forceps of new design, with slender shafts and bull-dog grasping jaws, which, like the tonsillotome, can be easily handled with either hand by an operator not possessed of the ambidextrous accomplishment. A mouth-gag should always be employed. I am now using a Ferguson gag so modified as to engage the incisors

only. For illumination an electric head lamp should be used, the child being held by a trained assistant.

Grave Haemorrhage Following Tonsillotomy. Dr. L. C. Cline, Indianapolis.

Abstract: 1. The liability to be misled as to a hæmorrhagic diathesis with all the ordinary precautions. 2. The failure of hæmostatics locally applied. 3. The sustaining of the patient by replacing the lost blood by calcium chloride and normal salt solutions and strychnia hypodermatically.

Pharyngocele. Dr. W. D. Black, St. Louis.

Abstract: Pharyngocele is a pouch or diverticulum of the pharynx. Etiology: Regarding the true origin of these pouches, there seem to be different opinions among writers on the subject. Apparent cause: First, congenital defects in developement; second, weakness of some part of pharyngeal wall; third, those due to stricture and developmental defects in the esophagus. Age in which they occur: The author believes that all those cases occurring under thirty years of age are due to defects in developement, except those due to strictures of the esophagus; over thirty, they should be classed under the head of the acquired form. Symptomatology: Rejection of food; dysphagia without pain; tumor at the side of the neck, etc. Diagnosis: Usually not difficult. Prognosis: Not dangerous to life in the majority of cases; Mackenzie and others report cases where the disease had existed for forty years. Treatment: Diet, proper eating and drinking; electricity, massage, bandage to the neck and surgical.

Report of case: Mr. X., aged fifty-four years, white, weight 170 pounds, occupation farmer. Previous history good; no specific or organic disease; patient apparently healthy; about two years ago patient experienced a soft mass protruding into back part of mouth and recurring at irregular intervals; there was no pain on deglutition. After some time patient claimed he could catch the mass between his molars, and there was very little pain on pressure. The mass appeared to rest on the base of the tongue when a digital examination was made, but only long enough to get a fair view of it. Treatment: Instructed patient about diet, and to

thoroughly masticate his food: electricity and strychnia: no great improvement. One month later patient died from suffocation.

A Case of Unilateral Nystagmus, with Remarks on the Probable Cause. Dr. S. Kirkpatrick, Selma, Ala.

Abstract: A very rare affection. Horizontal type; nearly all of the cases previously reported were of the vertical type. Refractive error the probable cause, as it was controlled by wearing a full correction for her anisometropia and oblique astigmatism.

Further Experience and Treatment of Keratoconus. Dr. J. A. L. Bradfield, La Crosse, Wis.

Abstract: Keratoconus in the incipient stage is not only curable, but considerable ectasia of the cornea can be reduced to normal corneal tissue. When the ectasia has advanced till the cornea becomes thinned, palliation is only possible and vision greatly impaired. Report of four cases illustrating the different stages and results of treatment.

The Burr in Mastoid Operation. Dr. A. Barkan, San Francisco.

Abstract: The advantages of using the burr in preference to the chisel and mallet. The early difficulties in securing proper and sufficient power and control of the burr. A description of the instrument and its application to the bone. When to change to a smaller burr. Special advantages in using the burr in approaching the lateral sinus. The burr as an instrument for removing the intervening bridge of bone. The use of the strabismus hook as an aid in removing the spur remaining. The use of the burr to the exclusion of the mallet and chisel. Exposing the tegmen tympani. Advantages: *a.* Lessening of shock; *b.* Shortening of time; *c.* The safer instrument; *d.* Facilitating the finishing touches; *e.* The beauty of the operation.

ABSTRACTS FROM MEDICAL LITERATURE.

By W. A. SHOEMAKER, M.D.,

ST. LOUIS, MO.

FOREIGN BODIES IN THE EYE AND THEIR REMOVAL WITH THE ELECTRO-MAGNET.

Wilbur B. Marple, (*Medical Record*, June 25) after discussing this subject carefully, recapitulates as follows:

1. An eye in which a piece of iron or steel is buried invariably deteriorates, and ultimately becomes blind (*siderosis bulbi*) if the foreign body is not removed, unless it becomes completely encapsulated. In many cases this degeneration is preceded by the symptoms of *hemeralopia*.

2. If the foreign body is in the anterior segment of the eye, the Haab magnet is almost universally used, at least to get the particle into the anterior chamber.

3. The injury in the great majority of cases, when it is in the anterior segment of the eye, is not attended with a prolapse of the iris, and the occurrence of this complication makes it probable that the foreign body has not penetrated the globe. This symptom, however, is not a reliable one in case the foreign body has made a large or irregular wound in the eye.

4. If the foreign body has penetrated into the vitreous, or posterior part of the globe, localization, either with the *sideroscope* or X-ray, had better precede any attempt to extract it, especially if the lens is still transparent. After the particle has been localized it can be removed by way of the anterior chamber with the Haab magnet, or by opening directly into the sclera near where the particle has been located. As to which is the better method to be employed in this class of cases, is still a matter of discussion among *ophthalmologists*.

5. If the symptom of pain cannot be elicited with the Haab magnet, this is to be interpreted as evidence (*a*) that there is no foreign body in the eye; (*b*) that it is enveloped,

in recent cases, in a fibropurulent exudation, or a blood-clot (Fehr's case), or, in less recent cases, that it is firmly encapsulated: (c) that it has passed entirely through the globe and is lodged partly or wholly in the orbital tissues (double perforation).

HOT WATER APPLIED DIRECTLY TO THE CORNEA IN THE TREATMENT OF CORNEAL INFILTRATIONS.

Manolesco (*Ann. d Oculist*, March, 1904): The effect of heat on the migration of leucocytes led the author to experiment with the action of hot water in deep infiltrations of the cornea, especially in parenchymatous keratitis. After cocaineization, hot water (80° to 90° C.) is allowed to fall drop by drop on the cornea. This application is continued from five to ten minutes and is repeated twice a day. The circum-corneal injection is increased and corneal vascularity becomes more apparent. This condition lasts from two to five hours.

Conclusions drawn from twelve cases treated in this manner are as follows: (1) In parenchymatous keratitis the treatment is superior to other local treatments: (2) it hastens the resorption of corneal infiltrations and serves also as an irritant; (3) it is easy to apply and is not followed by any ill effects even if the water is a little too hot.—*Inter State Medical Journal*.

EYE-STRAIN AS A CAUSE OF HEADACHE AND OTHER NEUROSES.

Simeon Snell, (*The Lancet*, London, April 30) after discussing this subject summarizes his paper under the following conclusions:

1. That eye-strain is the cause of a large proportion of headaches, often of a very aggravated character.
2. That various other neuroses are met with in association with headache, and among these may be mentioned the following: mental depression, nausea, indigestion, vomiting, insomnia, giddiness, choreiform movements of the eyelids and face, etc.
3. That relief is afforded to these conditions by correcting the error of refraction, which can be ascertained only after careful examination.
4. That for such examination a mydriatic is absolutely essential.
5. That frequently no complaint is made of defect of vision.
6. That the ametropia is frequently of low degree, 61.2 per cent. of my cases needing

0.75 D. cyl. and weaker. 7. That a cylinder of 0.25 D. is of great value. 8. That anisometropia is frequently present and requires proper adjustment. 9. That in a certain number of cases the muscle balance is faulty and necessitates the prescribing of prisms.

DIONIN AND ACOIN.

G. De Wagner Hallett (*Hom. Eye, Ear and Throat Jour.*, June) gives the following extracts from Darier's "Ocular Therapeutics."

Dionin.—The action of dionin is lymphagogue, deterrent, eliminatory, resolutive, stimulant and analgesic. Under its use the lymphatic channels become distended to ten times their original dimensions. Resolutive action is in proportion to the amount and duration of the chemosis. Patients with gout, Bright's disease and arterio-sclerosis respond with marked intensity. There is a variable action in young and vigorous persons. It has pronounced action in the scrofulous and lymphatic subject, but less so than with Bright's and heart disease.

MODE OF EMPLOYING DIONIN.

A 2 per cent. solution is a good strength with which to start. It is better not to prescribe the solution for patients' use until you have demonstrated its reaction on that particular person.

Instill cocaine first; then a drop of dionin, and wait several minutes to observe results; then another drop. Do this particularly in those suspected of a lively reaction.

In those with good circulation the lymphagogue action is but slight, and chemosis sometimes cannot be obtained. There will be but slight swelling of the conjunctiva, with dilation of the bloodvessels and always a peculiar brilliancy of the cornea.

The first application will be more effective than the second, made the next day, but after an interval of several days it will again be like the first.

Tolerance is often produced after several days of use, and then it is without reaction.

Once you know how the particular patient will react you can prescribe it for home use.

Instilled into the conjunctiva on the day of a subconjunc-

tival hæmorrhage, it causes a pink chemosis, the blood being imbibed by the fluid in the lymph spaces. It is supposed to dissolve the altered red corpuscles and revive the leucocytes. The disappearance of the hæmorrhage is hastened.

Hæmorrhage in the anterior chamber absorbs more rapidly if dionin is used.

It favors cicatrization of corneal wounds after operation. But harm may come through the *violent sneezing* that it often causes.

In slight abrasions and traumatisms of the cornea you may order five or six times a day a drop of

Dionin	gr. jss.
Cocaine hydrochlorate	gr. jss.
Sol. cyanide of mercury 1-2000	5 ijss.

With already infected wounds use the cyanide stronger, 1-1500 or 1-1000. Here the solution may be ordered hourly or half hourly.

When using the solution for corneal infiltration or slight parenchymatous keratitis, it is well to add a 2 per cent. sodium chloride for the purpose of augmenting the entropic action of the dionin.

Dionin	gr. jss. to gr. iij.
Cocaine hydrochlorate	gr. jss.
Sodium chloride	gr. iij.
Sol. cyanide of mercury 1-1000	5 ijss.

Where the iris is or may be involved add atropine:

Atropine sulphate (neutral)	gr. $\frac{1}{3}$ to $\frac{1}{2}$.
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In the same way, if a contracted pupil is desired, add:

Pilocarpine hydrochlorate	gr. ss. to gr. jss.
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If the case be one of glaucoma, the cocaine must be omitted and then add:

Eserine sulphate	gr. $\frac{1}{4}$.
Pilocarpine hydrochlorate	gr. $\frac{1}{4}$.

This collyrium has the advantage of stopping promptly the painful phenomena of glaucoma, diminishing the intra-ocular tension and contracting the pupil, while it hastens the clearing of the cornea. Its employment is favorable for preparing the eye for operation in all forms of glaucoma when the phenomena of irritation are too violent to permit of immediate surgical intervention.

Alcoin is a medicament discovered and produced by Heyden's chemical laboratories near Dresden. In man, instilla-

tions are only effective when there exists a solution in the continuity of the corneal or conjunctival epithelium. Under such circumstances it has an analgesic action which lasts for several hours, depending upon the strength of the solution used. It is therefore valuable in burns and traumatic erosions of the cornea. Acoin is non-toxic. Seven and a half grains introduced in capsules into the empty stomach of a dog produced no symptoms. One half this amount of cocaine used in the same way killed a dog, weighing 11 pounds, with violent tetanic cramps. A concentrated solution instilled into the eye of a rabbit produced an anaesthesia lasting several days, and at the same time a lively irritation of the cornea and conjunctiva. Used in a rabbit's eye, anaesthesia resulted as follows:

- 1-1000 anaesthesia for 15 minutes.
- 1-400 anaesthesia for 30 minutes.
- 1-200 anaesthesia for 60 minutes.
- 1-100 anaesthesia for 80 minutes.
- 1-40 anaesthesia for more than a day.

The last named strength produces considerable irritation but no permanent trouble. A 6 per cent. solution subcutaneously used on a rabbit caused a slough when more than 3 c.c. was used. Not so with weaker solutions.

Solutions of acoin are very antiseptic. They should be kept in the dark. After a week some deterioration takes place, and it is perhaps better to prepare the solution immediately before it is used. Acoin is precipitated by the least trace of alkalinity, and to avoid that it is necessary to wash the flask in which it is proposed to make a solution, with an acid such as nitric, and then with distilled water before it is used. Hot water should not be used to make solutions of acoin. A few drops of the 1 per cent. solution of acoin added to solutions of dionin, or mercury cyanide, or the two combined renders their subconjunctival employment almost completely painless. It is desirable to render the conjunctival puncture painless, and an instillation of cocaine may be first made.

ACOIN AS A LOCAL EPITHELIAL ANAESTHETIC.

Following the method of Schleich, Darier used acoin to render the skin insensitive in such a manner as to facilitate

small operations. Using various other ingredients, he finally settled upon the following as giving the best results:

Aeoin	gr. jss.
Na Cl	gr. xij.
Distilled water	5 iij. M.

Ethyl chloride was tried as a method of making the first needle prick painless, and it was found that the spray was more painful than the prick alone. It was then abandoned.

The first insertion of the needle is slightly painful, but very much minimized by injecting very slowly. A few drops so injected cause a wheal of about two-fifths of an inch in diameter. This can be enlarged at will and painlessly by making any number of further injections near the edge of a previously made wheal. The anaesthesia so produced lasts longer than with the solution of Schleich. There are no consecutive pains. The area of insensibility is maintained perfectly for forty or fifty minutes and then gradually contracts.

ARTERIO-SCLEROSIS AND ITS BEARING UPON CERTAIN LESIONS OF THE RETINA AND OPTIC NERVE.

Chas. Stedman Bull (*Annals of Ophthalm.*, Jan.) in discussing the subject, refers to the attention that has been given the pathology of endarteritis and endophlebitis of the retinal vessels, and to the fact that the clinical side of the question has been practically lost sight of.

Certain changes in the retinal vessels, characterized by the appearance of white stripes along the vessels, are recognized as opaque whitish tissue due to inflammatory exudation in the walls of the vessels. This condition is of importance as an indication of similar conditions existing in other parts of the body and is often a warning signal of impending cerebral apoplexy. It is often met with in diabetis and renal diseases, but we have learned to look upon it as the cause and not as the result of nephritis.

In certain diseases of the retina, as retinitis albuminurica, we have a proliferation which may double the thickness of the walls, and narrow or close the lumen of the vessels, without being visible with the ophthalmoscope. A point brought out by Raelmann's investigations is the close resemblance between closure of the lumen of a vessel by an embolus or a thrombus, and the same condition due to endarteritis obliterans.

nodosa. He has proved by the microscope that this condition may occur without a thrombus, by proliferation of the intima, completely closing the lumen of the artery with all the subjective symptoms of sudden blindness from embolism. In arterio-sclerosis the process is not confined to the blood-vessels, but the parts supplied by these vessels participate in the form of interstitial inflammation or proliferation.

Arterio-sclerosis begins in the smaller vessels and thence extends to the larger branches. We are fairly familiar with the effect of this disease upon the retina and the clinical symptoms observed in these cases. But we are not so familiar with the effect on the optic nerve. Circumscribed atrophy of the optic nerve may be caused by sclerosis of the internal carotid and ophthalmic arteries, which induce dilatation of these vessels in places, hardening of the walls and pressure on the optic nerve by mechanical means. He suggests that perhaps many of the cases of scotoma and temporal limitation of the field of vision, not showing any ophthalmoscopic changes, may be due to this cause. He is also inclined to think that many of the cases of so-called simple chronic glaucoma are cases of atrophy of the optic nerve due to retrobulbar arterio-sclerosis of the ascending internal carotid, or ophthalmic or anterior cerebral artery, which, by pressure on the optic nerve posterior to the foramen, has caused the descending atrophy.

Wherever the location of the pressure, the resulting atrophy of the nerve is at first a pure "pressure atrophy," which is propagated downward and forward toward the disc, and upward and backward toward the chiasm. Later in the course of the disease, there is probably added to this a secondary proliferation of connective tissue between the nerve fibre bundles which induces a more extensive atrophy. Where the atrophy actually reaches the disc we must assume the existence of this secondary atrophy.

In the present state of our knowledge we can not expect to restore the calibre of the diseased vessels or to reduce the infiltrated and indurated tissues to their normal condition by therapeutic measures. We may, however, hope to arrest the progress of the disease and limit its extension by the long continued use of iodides, especially the iodide of potassium.

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ORIGINAL ARTICLES.

REMARKS ON GLIOMA OF THE RETINA AND THE QUESTION OF ROSETTES.*

By ADOLF ALT, M.D.

GLIOMA of the retina is a well established clinical entity. It is a tumor of the retina which makes its appearance in infancy, frequently at such an early period of infancy that that it may be considered as congenital, and, if left to itself, not only destroys the eye or eyes affected, but the life of the afflicted individual in a comparatively short space of time. Its malignancy, equal to that of the small cell sarcoma, while varying in intensity, is its chief characteristic feature and the cases reported in earlier literature in which gliomata are said to have undergone a regressive metamorphosis which led to a cure, must, in the light of modern science, probably be rejected as errors in diagnosis. We know now that a child affected with glioma is doomed to an early death and under horrible circumstances, unless the eye be removed at the earliest possible date. Even then, however, our efforts may be and are often unsuccessful, although every one of us probably have had a number of cases in which the early removal of one such eye or perhaps of both, saved a life. There is little to add to the well known clinical picture and it is not the object of this paper to waste time with it.

Read at the 9th meeting of The American Academy of Ophthalmology and Oto-Laryngology held at Denver, Aug. 24th to 26th, 1904.

It is different with our knowledge of the genesis and histopathology of this terrible disease, and, while much time and intelligent labor has been bestowed on the unraveling of its secrets, we have, I think, not been altogether successful in determining its true nature and origin.

In discussing the pathogenesis of glioma we have to turn back to its first intelligent description. In his classical lectures on tumors, on which the modern views on glioma are based, (Berlin, 1864) Virchow says: "The nature of the neuroglia differs very much in different places. It is sometimes firmer and more like connective tissue, sometimes so soft that it appears as an amorphous or granular substance. The structure of the neuroglia, where it is most characteristic, is such that we find round, lentilshaped, or spindle-shaped, or branched cellular elements, lying at some distance from each other in a very soft and therefore very easily destroyed substance which is at once changed by pressure, water, and so on, and which when examined in a fresh state has a finely granular appearance. * * * *

* * * * This substance appears traversed by fine fibrillae crossing each other in all directions, of which it is difficult to say, whether they are preexistent or result from a coagulation of the original substance. * * * *

* * * * The cellular elements contained in this substance are extremely friable so that in consequence of cutting, pressing or teasing the majority is destroyed and only their nuclei are found surrounded by a loose substance which is not unlike the intercellular substance. * * * *

* * * * It is not at all certain whether these cells are round or branched. In hardened specimens it appears often, as if the fibrillar network was formed by the cell branches."

A more localized hyperplasia of this tissue he terms glioma and gives a very detailed description of the different forms of glioma of the brain. Their course is in general a very slow one and they may grow to a considerable size before causing any morbid symptoms.

He later goes on to say: "Into this category we must place certain tumors of the retina, which thus far have been called carcinoma bulbi. These are progressive growths, coming from the soft connective tissue of the retina, which in their

structure correspond exactly with the brain tumors just described. But, it is very difficult to sever them from sarcomata, etc." Later on again he says: "I have already stated that there are transitions to sarcoma and that these gliosarcomata give us much matter for thought."

In the following decades numerous investigators added but little to Virchow's description. The main question raised was always, whether we had to look upon glioma as a special form of tumor grown from neuroglia or as a small round cell sarcoma, and in this question no uniform opinion has been reached even to this day. My own leaning was always towards the sarcoma side, since I could and cannot understand, how glioma of the brain, a comparatively slow growing, almost benign tumor, and glioma of the retina a rapidly growing, destructive, and extremely malignant tumor, could be essentially the same. The different authors have found retinal glioma to spring in turn from all the different layers of the retina, yet, we can hardly say that these statements are of real value as glioma has so far not been seen in its earliest beginning. Most observers think that one of the granular layers gives rise to glioma. Since Ginsberg has found in two microphthalmic eyes the elements of which the retina consists were in places transposed, so that elements of one layer were situated in one to which they did not belong. Greef believes that in accordance with Cohnheim's theory we may assume that glioma may and probably always does spring from such misplaced tissue germs. Greef himself and after him Hertel have found glia cells (spidercells) in retinal glioma by means of the Golgi-Cajal method. They and other observers have also found ganglion cells and La-grange went even so far as to distinguish between four different forms of glioma, one of which he characterizes by the presence of ganglion cells. Having examined a considerable number of gliomata and having as a rule found smaller and larger parts of retinal tissue still recognizable, even in the interior of tumors which filled the eyeball, I cannot see why such findings should be looked upon as anything extraordinary. These cells are probably nothing else but the remnants of the affected retina and not newly formed. Their presence seems therefore quite natural.

Aside from ganglionic cells I have often found whole patches of neuroglia cells and fibres which evidently belonged to the inner layers of the retina and which were undoubtedly preformed and not belonging to the new growth, although they were buried within it. (Fig. 1).

We differentiate, as is well known between two forms of glioma: glioma endophytum, in which the growth at first affects the inner parts of the retina and grows inwards towards the axis of the eye squeezing the remains of the retina towards the sclerotic and later on the lens and iris

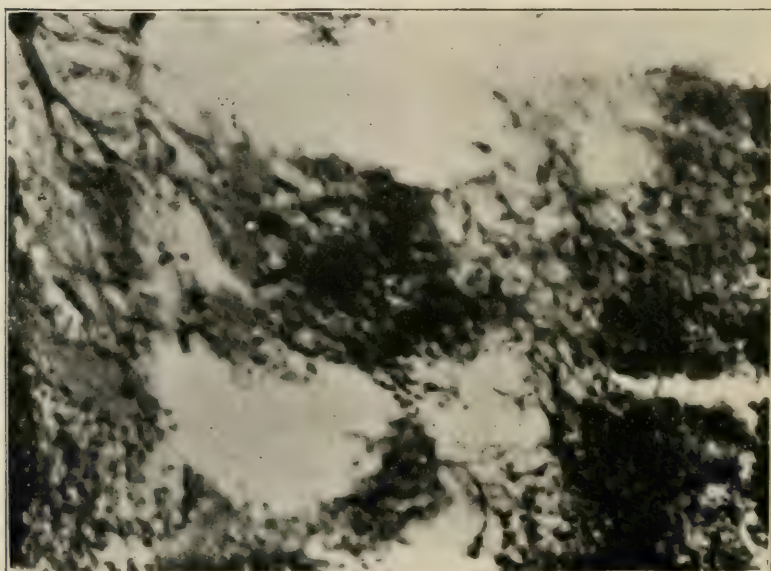


FIG. 1.

against the cornea; and a glioma exophytum, in which the tumor springs from the outer layers of the retina and leads at an early stage to detachment of this membrane. In the progress of the disease, the regular typical stages of all intra-ocular growths are gone through till perforation occurs at the corneoscleral margin or backwards into the orbital tissue and metastases occur in the cranium and distant organs leading to death.

It is now generally conceded that the typical structure of glioma is that of spherical and cylindrical lobules, almost each and everyone of which has a centrally located bloodvessel.

The glioma cells thus forming a spherical or tubular mantle around the bloodvessel are biggest and most vigorous in the immediate neighborhood of the vessel, but at a certain and strangely uniform distance from the vessel they abruptly show all the characteristics of degeneration. New cell cylinders may grow into this degenerated mass and when the whole eyeball is filled with glioma, the typical structure may no longer be recognizable and the tumor appears to consist solely of round cells of varying sizes with here and there a bloodvessel. Evidences of frequent hæmorrhages into this tissue are never wanting, even in small gliomata.

When examining into the nature of the cells of which the tumor consists we can distinguish the following:

1. Small round cells, often giving off small branches and thus appearing bipolar or multipolar, of which by far the largest part of the glioma consists. They have a large nucleus and very little protoplasm. As stated above Greef and Hertel seem to have proven these to be neuroglia cells in the sense of Virchow's description.

2. Larger, sometimes very large, round cells containing cell debris and pigment granules, probably leucocytes. Also polymorpho-nuclear leucocytes and round cells with an oval nucleus.

3. Slightly spindleshaped or clubshaped cells, especially directly around bloodvessels.

4. Ganglion cells.

5. Pigment epithelium cells, often only recognizable as such by a few pigment granules.

The authors are not agreed whether or not there is an intercellular substance between these cells.

Besides the cells there are fibres and sometimes fibrous septa, remnants of the fibrous structures of the retina and atrophied bloodvessels.

The bloodvessel walls are seen to undergo different modes of degeneration, the hyaline degeneration of the endothelium (Fig. 2) as well as of the outer walls, being the most frequent. Later on deposits of lime take place within the tumor and in its periphery. They appear first as small roundish bodies enclosed in cells, later on greater quantities may form large plates and roundish conglomerates. The

quantity of such lime deposits varies greatly in different tumors.

In a number of gliomata certain figures are found in the sections among this apparently uniform mass of cells which while well known long ago, were not looked upon as anything important and which were thought to be due to the infolding of the retina, until in 1897 Wintersteiner published his startling monograph on *The Neuro-epithelioma of the Retina* imparting a particular and important role to these formations. He described them under the name of *Rosettes* in the following

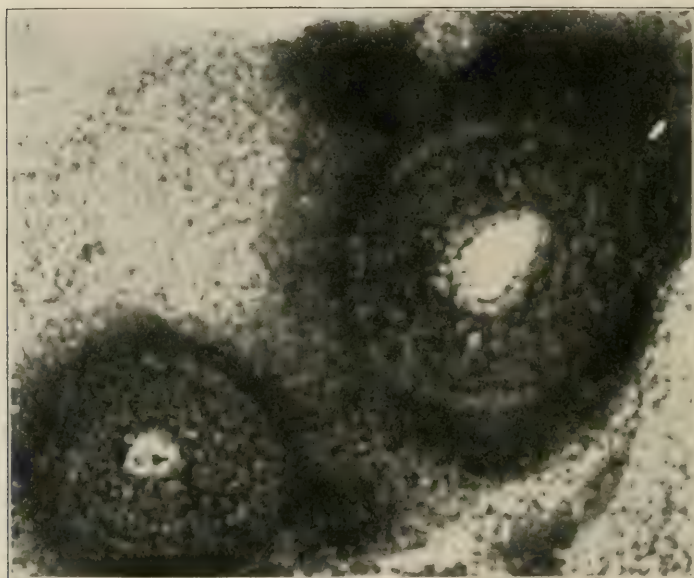


FIG. 2.

manner: "In the most pregnant cases rosette-like formations are found which with a low and medium magnifying power look very much like transverse sections of glandular tubes. They consist of from 12 to 20 slender, cylindrical cells arranged in a circle. In their club-like broader distal end lies the round or oval nucleus, while towards the lumen we find a small amount of protoplasm which is at first broad and then narrows neck-like, and finally swells up to a basal plate ending in a sharp glistening line. The "feet" of these cells touch each other, so that their basal lines together form a continuous basal membrane toward the lumen. The lumen

of the rosette is mostly empty, but frequently I could detect some contents within it, viz: 1) small club or rod-shaped elements which are stained only with protoplasmic stains and which adhere with their smaller ends to the basal membrane of the cylindrical cells, or lie free in the lumen; 2) cells which are in every respect like the cells of the tumor, just as they are lying outside of the rosette." He further states that these formations are essentially hollow spheres, although they *may have an opening on one side where the margins may*



FIG. 3.

be rolled in, as seems to be the rule, so that tumor cells can penetrate into the cavity. In this way he explains certain spiral figures and partial rings. The shape and number of these formations vary greatly in different tumors. Sometimes they seem to be altogether absent, in others they are so frequent that they fill the whole field. Neither is there any rule as regards the locality in which they are found within the tumor. He even found them in an extra bulbar growth in the neighborhood of the optic nerve.

As to their origin Wintersteiner comes to the conclusion

that: "These rosette, ribbon and arc-like cell formations must be looked upon as aggregates of rodfibres and, perhaps, cone-fibres. Their nuclei, therefore are the equivalent of the granules in the outer granular layer, the glistening line toward the lumen of the rosette of the *limitans externa* and the particles of protoplasm which adhere to it are rudiments of undeveloped rods and, perhaps cones." Thus, what had been considered as accidental, natural and unimportant, was by Wintersteiner given such an important place

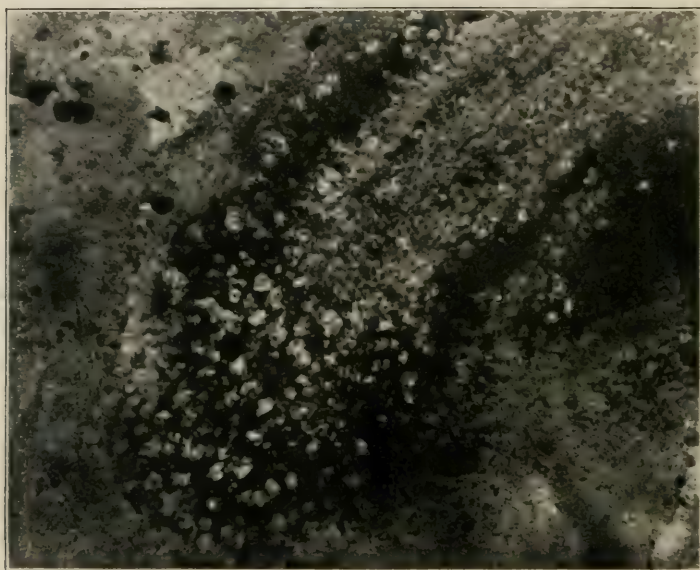


FIG. 4.

in the histogenesis of glioma of the retina that he even gave to the tumor the name of *neuroepithelioma retinae*.

Ginsberg does not accept this view and thinks that the cells forming rosettes are not neuroepithelial in nature, but rather cells of the primitive retina which have not yet been differentiated into spongioblasts and neuroblasts and he compares the cells forming the rosettes with those of the *pars ciliaris*, which indeed they resemble very much. He thus, also, considers them to be different in character from the glia cells.

Greef, while accepting Wintersteiner's views as to the rudimentary neuroepithelial character of the rosettes, says:

"Glioma is a tumor which takes its origin from a malformation in the retina, from misplaced embryonic cells. It consists in the main of hyperplastic glia cells and a network of fibres formed by their branches."

According to these views, then, what has been described as a scant granular intercellular substance, seen by some, denied by others, probably is the fibrous network belonging to the glia cells, and the rosettes are due to different tissue elements.

In 1901 Brown Pusey having stained glioma sections with



FIG. 5.

Mallory's phosphotungstic hæmatoxyline thought he had proven that fold of the inner surface of the retina formed the rosettes and that the glistening line described by Wintersteiner was nothing else than the membrana limitans interna retinae. In a more recent paper on retinal rosette formations of neuroglia in inflammatory processes, he acknowledges that this was a mistake and he declares himself satisfied that he had to deal with the membrana limitans externa. However, the rosettes which he described and which are of common occurrence and well known to every eye pathologist seem to me to differ from what Wintersteiner called rosettes,

since they are undoubted remnants of a once fully developed, but diseased and partly destroyed retina, just as we find them in a great many specimens of detached retinae, the atrophied folds of which are glued together, as they may even as such be found, also, in cases of glioma, where they can always be recognized as folds of the formerly fully formed retina. (Fig. 3). Even Murakami describing such rosettes in a microphthalmic eye, in my opinion, has fallen into this error.

Brown Pusey further on in his last paper says: "It may

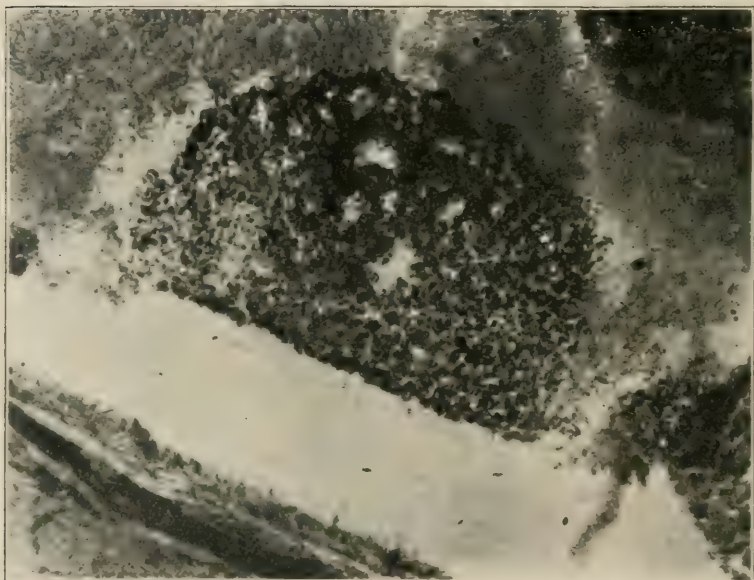


FIG. 6.

be permissible to say that the conclusion that the rosettes are neuroglial in character is much more in harmony with the general teachings of pathological anatomy and is more nearly what we would expect, from the findings of *similar rosette formation in gliomas arising in the brain*, than the suggestion that these formations are made up of cells which form rudimentary rods and cones.

Being convinced of the fact that Wintersteiner must mean something quite different and having recently obtained a number of glioma eyes from my own practice and that of others, I studied these as carefully as I could in order to

have an opinion of my own on this question. The results of this study I wish to bring now before you and to illustrate with numerous photographs. I had at my disposal specimens of nine older cases of glioma from my own collection, five specimens kindly loaned me by friends and two new cases of my own. These latter eyes I cut in series without interruption. The rosettes of Wintersteiner I found in five of these cases. Whether they might not have been found in most or all of these cases, had a sufficiently complete examination been made, is impossible to tell. At any rate the rosettes which I have found correspond in the main with the de-

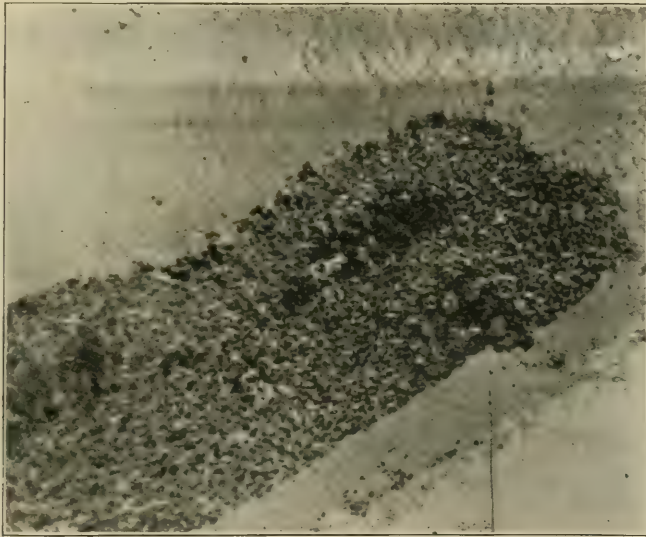


FIG. 7.

scription and drawings of Wintersteiner and cannot be confounded with folds of a previously well developed retina, as described in the cases of Pusey and Murakami.

In trying to get an understanding as to the nature and origin of the rosettes I found in these glioma specimens, as I had seen previously in many degenerating retinæ, a large number of openings, transverse sections of small cavities, especially where the outer layers of the retina could still be recognized and which I thought might have some bearing on rosette formation. It seems that these openings are lying more especially in the external granular layer. (Fig. 4). While

they usually appear to be empty or perhaps to contain a colorless perfectly transparent fluid, they are in some sections traversed by numerous fibres which can be traced back to the cells from which they spring and which I take to be neuroglia cells. Such cells and fibres are found quite frequently also in parts of gliomata, where from their arrangement there must be looked upon as belonging to the inner layers of the retina. (Fig. 5). The exact character of these openings it is difficult to deter-



FIG. 8.

mine, unless, they are akin to the larger cavities formed for instance in so-called gliosis of the spinal chord, where they are considered to be due to the degeneration of glia tissue. It, therefore, does not seem that these particular cavities have anything to do with the formation of rosettes. But there are other openings to be seen, especially in the sections of young nodules which are just formed or forming on the choroid, sometimes, also, in a remnant of vitreous body. (Fig. 6 and 7). These look much more like the Wintersteiner rosettes and differ from them only by the fact that the lumen always

contains one or more pigment epithelium cells, or normal or degenerating red blood cells. Still, I think that these are really rosettes in their earlier stages. The tumor cells surrounding these openings have no peculiar shape; they are simply round cells, but they are pressed together more closely than those lying more peripherally.

In the periphery of the tumors and in the secondary nodules, which grow up like plants from seed, wherever glioma cells have happened to fall, pigment epithelium cells are very frequently found enclosed between the tumor cells. Such a pigment epithelium cell having become destroyed and the pigment having been carried away, may well leave behind a hollow sphere to mark its former site.

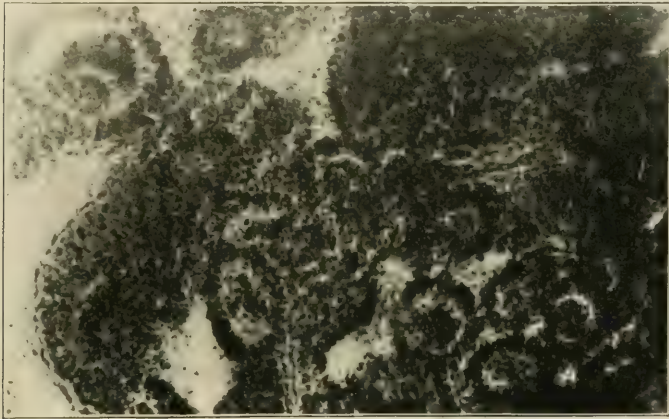


FIG. 9.

In eyes with a detached retina, especially after an injury to the anterior part of the eye, we often find a coagulated exudation filling all the space between choroid and retina. In such cases the exudation, where it lies on the pigment epithelium, looks as if it had been corroded, because every pigment epithelium cells is surrounded by a clear, perfectly transparent spherical area, and even when the pigment cell itself has disappeared, such a clear space marks its former position. Whether this is an exudation from the pigment cell or not, is hard to say, but it seems that a similar formation might also take place when a pigment epithelial cell is surrounded by glioma cells. (Fig. 8).

Such observations, and others which I shall detail, make it very probable that Wintersteiner rosettes may be found when glioma cells grow around some tissue enclosure, and there is much to offer in support of such a view.

It is a striking fact that the tendency of growth in a glioma is not in a plane, but in a spherical or cylindrical manner. Young nodules spring forth from older ones in a way which may best be compared to the formation soap bubbles, only the glioma nodules are solid. Only where the glioma tissue encounters a more resistant tissue, like the *limitans interna*

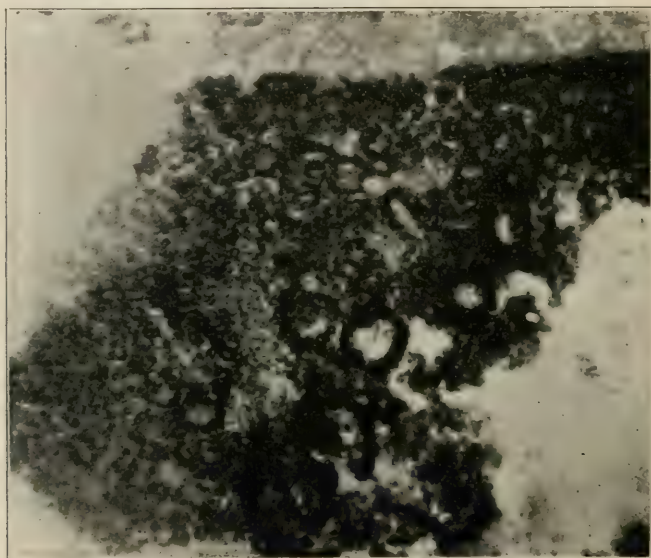


FIG. 10.

or externa of the retina, or the lamina vitrea of the choroid, does it grow for a time in a plane along such an obstacle, till it has broken through it in some place, when at once a spherical growth begins. Such facts can be best studied in the peripheral, the younger parts of the tumor. As a rule, every such spherical and younger bud shows a centrally located bloodvessel, around which the cells seem to group themselves; when by pressure the spherical growth is forced to assume a cylindrical or tubular shape, the bloodvessel lies in its axis. In the early stages the tumor cells immediately surrounding such a bloodvessel are round and of the same shape as the more peripheral ones. (Fig. 9). In older nodules, however,

these more densely packed, central cells often—not always by any means—assume a cylindrical or spindle shape and thus in the sections form a marked darker ring around the bloodvessel wall. Should in such a case the bloodvessel wall become degenerated and disappear, the result would be, and I think often is, Ginsberg's statement notwithstanding, a Wintersteiner rosette. Yet, Wintersteiner says the rosettes are made up only of rudimentary rods or cones, or tumor cells. Even if I should be wrong in the opinion that rosettes may be formed in the manner just described, I have found numer-

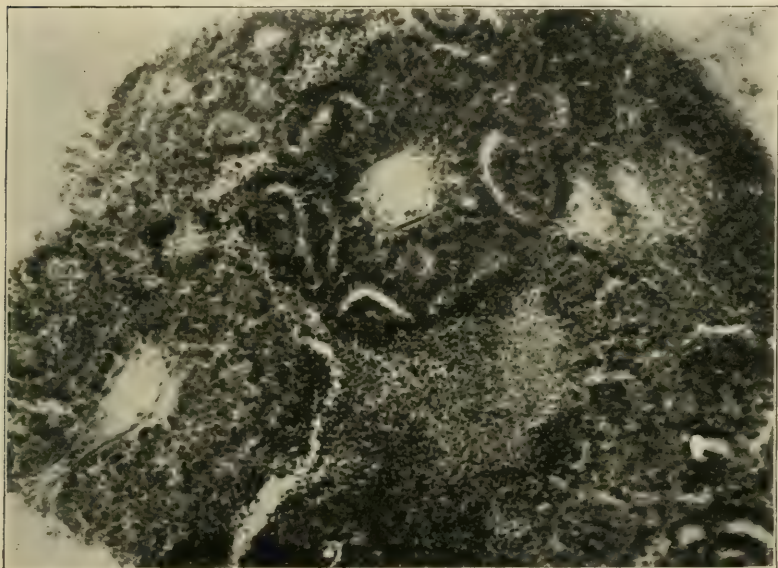


FIG. 11.

ous rosettes which instead of being characterized by the so-called rod and cone fibers and cells with a limitans externa, are formed by round cells in no way different from the other tumor cells in their neighborhood. (Fig. 10). Many of the formations I have seen are so grotesque in shape that the hollow sphere of Wintersteiner and other observers can have had nothing to do with their formation. There is nothing unreasonable in assuming that in the same manner as rosettes maybe formed around bloodvessels, they may also be formed around lymph channels, whether these are preformed in the retina or newly formed during the growth of the tumor.



FIG. 12.

If, as some authors will have it, the peculiar shape of the cells composing the ring around the bloodvessel is due to their lying so closely to the source of nutrition and consequently overfeeding, the same may be the case with the cells surrounding a lymph channel.

Many rosettes in my specimens do not simply form a ring

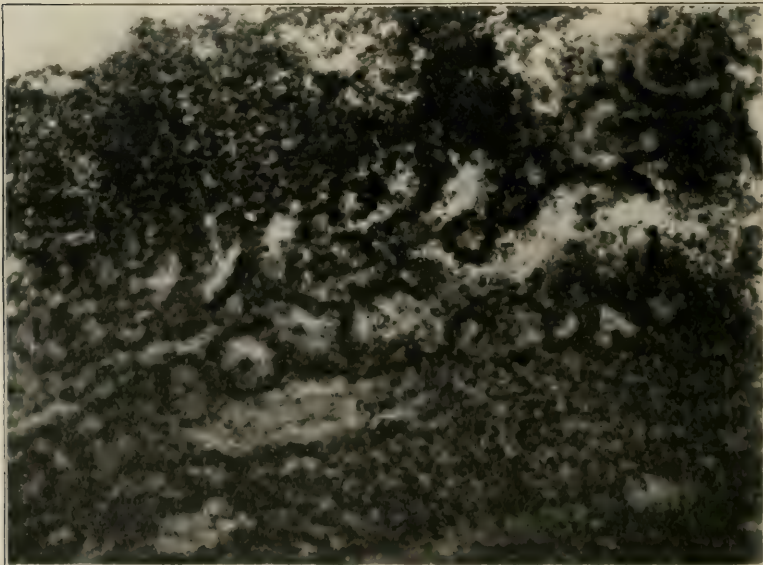


FIG. 13.

and only one ring. (Fig. 11). The majority, even, form curved channels, sometimes arranged in such a manner that the similarity to the distribution of small bloodvessels is very striking. (Figs. 12 and 13). These, as well as rings, have often a central mass of tissue, tumor cells, I think, surrounded by a transparent, perhaps empty, space. Two rings surrounding such a cell mass concentrically are quite frequent. (Fig. 14). The glistening membrane which Wintersteiner calls the *limitans externa* and which he finds almost always, is often absent, or, as Ginsberg says, it is

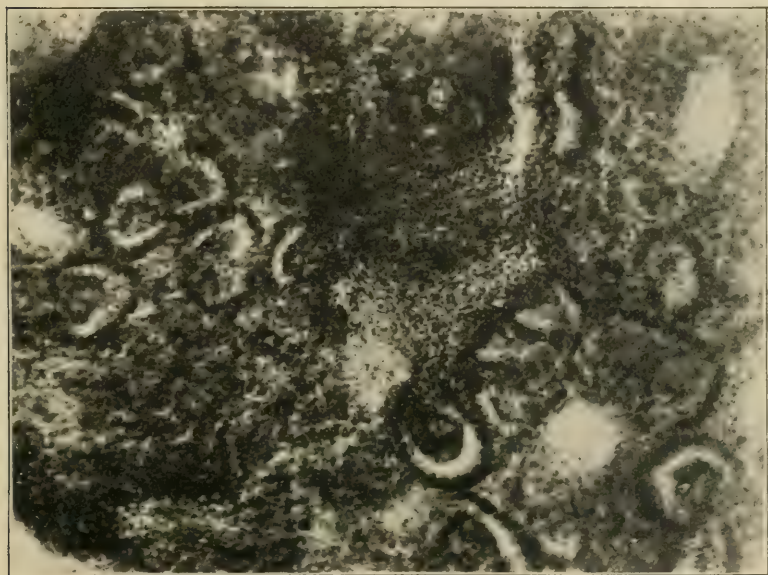


FIG. 14.

simply the sharply defined outline of the ends of the cells surrounding the opening.

While the foregoing seems to point to the fact that rosette formation is due to the growing of tumor cells around a tissue enclosure, I am not at all blind to the fact that many tissue enclosures do not produce rosettes. There must evidently be certain special conditions present which lead to rosette formation, perhaps of an osmotic nature.

If the rosettes are not due to rudimentary rods and cones, the importance given to them by Wintersteiner, and the name neuro-epithelioma, are out of place.

Pusey, without giving his authority, says that rosettes have also been found in glioma of the brain. This would decidedly support my views.

He also gives to the presence or absence of rosettes in a glioma a practical side, by asking whether retinal gliomata with rosettes are less malignant than those without such formations. A priori, I should from the foregoing say that their presence or absence can have no bearing on the clinical character of the tumor, and, in fact, from observation in some of my cases, I know this to be so.

Rosettes, therefore, may be looked upon probably as mere accidents of growth in a glioma.

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DISCUSSION.

DR. H. GIFFORD (Omaha): I cannot say I have any important contribution to make, but I think Dr. Alt's observations are worthy a great deal of consideration, because this question, from a microscopic standpoint, is important. I rise particularly to see if I can get any light on the clinical diagnosis of glioma. I have under observtion now a child, I have kept track of for the past six years, who came to me with the typical picture of glioma. I was on my guard against making a snap-shot diagnosis of glioma, fearing it might be a case of pseudo-glioma, as I had been fooled on that in my earlier career. It had none of the history of the slight or severe inflammation which is apt to precede the pseudo-glioma, but all the appearance of the yellow, glistening nodules coming out in the clear vitreous, and none of the dull yellowish appearance of pseudo-glioma. Altogether, I felt justified in saying that the child had glioma without

question. The mother declined to have the operation done, but she has brought her in for examination every six months since. The tumor has kept increasing, at no time showing signs of inflammation. The lens has become opaque in a peculiar way, having a yellowish, uniform appearance, and now looks like a celluloid imitation of ivory. This fills up the whole lens capsule. The child is perfectly well, and although I have tried to get the specimen every time I have seen the patient, I have not succeeded yet. I may have made a mistake. It is a question whether some gliomata do not last longer than we expect without killing the patient. The pressure was at no time increased. On the other hand, it has not decreased. The iris is perfectly uniform and normal in appearance, except slightly pushed forward out of the normal plane. Another case is that of a little girl in which I enucleated the eye some fifteen years ago, in whose case the diagnosis was also apparently unquestioned and in which I confirmed the diagnosis with the microscope. My sections showed that the glioma cells reached back into the optic nerve, clear back to the point where it was cut off. I recommended most urgently that she have an evisceration of the orbit. The parents refused to have any further operation performed, and yet the girl is alive and well to-day.

DR. EDWARD JACKSON: Dr. Gifford's case of a child under observation for six years with an ophthalmoscopic diagnosis of glioma, without the usual progress of the case, brings to mind one I have seen where the microscopic appearance justified the diagnosis of glioma. The lens was clear; the anterior portion of the vitreous was clear, but the upper two-thirds or three-fourths of the vitreous were apparently filled with the mass. This occurred, however, in a woman of 40 years of age, with a history of an eye blind for many years, and of course the probable diagnosis is cystic degeneration in the retina; but it raises the question whether Dr. Alt's observation as to the cavity formation around epithelial and other cells derived from the normal tissue, offer any explanation of these rare cases that have been reported, some of which have been enucleated for glioma, and which are certainly not of the malignant character of glioma. It is the only case of the sort I have ever seen, where I

thought the ophthalmoscopic diagnosis of glioma would be justified, but where the patient had been for years without change and the tension remained perfectly normal.

DR. B. E. FRYER (Kansas City): The Academy is to be congratulated and should be thankful for this admirable paper with illustrations by Dr. Alt. There are very few of us who have the patience to go through the work required to produce such a paper, to say nothing of the illustrations. Moreover, there are very few, even, well advanced pathologists who know how to interpret all that is shown here, as he does so perfectly and fully. From the standpoint of a pathologist, it seems to me the Doctor has made everything very, very clear, and he should be congratulated and thanked for it. It would also seem that such observations confirm the Cohnheim theory more completely, and, while it is still under judgment of the pathologists, I feel that it will be more and more confirmed.

DR. EUGENE SMITH (Detroit): I wish to report a case seen in consultation. It was a glioma of the retina, as far as I could tell, but the pathological examination showed it to be an unpigmented round cell sarcoma. The eye was enucleated, supposing it to be a glioma of the retina. I would like to ask if a case of that kind is as malignant as the gliomatous sort. Would that have some bearing on these cases living for some time? Are such cases rare?

DR. ALT (closing discussion): In regard to the case of probable tumor of the retina which Dr. Gifford reported, I had a similar experience eight or ten years ago. A boy between five and six years old was brought to my clinic. He was blind in one eye, and I found a tumor mass in the vitreous which filled the posterior half of the vitreous cavity with the retinal bloodvessels, as I took them to be, on the surface. They were so arranged. We must not forget that we do not really see the glioma, but only the anterior portion of the retina. My diagnosis in this case was glioma, and I wanted to enucleate the eye, but was not allowed to do so. I found on examining the case carefully that the child was the subject of hereditary syphilis, and instituted a vigorous anti-syphilitic treatment. After five or six months the tumor began to shrink gradually and to get smaller and smaller, and about a

year and a half from his first visit to me I found there was no tumor, but the retina, with numerous atrophic patches, was back in its normal position. It thus became clear that it was a gummatous tumor of the retina which had grown deeply into the vitreous body. Perhaps Dr. Gifford's and Dr. Jackson's cases are of a similar, or of a tuberculous nature.

With regard to the question of Dr. Jackson whether what I have described may explain the formation of retinal cysts, I do not really know. All retinal cysts which I have seen have been connected with detachment of the retina. The way in which they were formed was that fluid was retained between retinal folds which were crowded together; later the walls of such a cyst gradually become thinner, and several smaller cysts may coalesce to form larger ones.

The unpigmented, round cell sarcoma in a child, referred to by Dr. Smith, is not new. I have seen and published two such cases. In both cases the tumor sprang from the deeper cells of the ciliary body and grew into the anterior chamber through the meshes of the ligamentum pectinatum.

A CRITICISM ON THE USE AND ABUSE OF THE LACRIMAL PROBE.*

BY GEORGE F. SUKER, M.D.

AKRON, OHIO.

THE trend of argument to be pursued in this paper is to offer substantial vindication on the one hand that the use of the very large lacrimal probe is bad ophthalmic practice, and on the other to conservatively uphold the employment of the small or medium probes as infrequently as possible. The writer is fully cognizant of the fact that he is discussing a question which has an array of able supporters on either side. He is likewise aware that a greater proportion of them are staunch adherents of the very large probe rather than the small or medium probe for all such conditions for which the writer exclusively advocates the small one. It must be admitted, however, that the adherents of either the one or the other are obliged to look upon those affections that necessitate the use of any probing as a *bête noir* in ophthalmic

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surgery. Again, there is a good deal of truth in the saying that "If you once pass a lacrimal probe, that patient is liable to become a probe victim for ever and a day." As a matter of fact, all probes are an evil, and the larger the lacrimal probe the greater the ultimate evil that ensues from its unwise employment.

The rather promiscuous employment of the large lacrimal probe had its inception in the use of large sounds for urethral conditions which in part are analogous to those in the lacrimal canal. If there was a closer anatomical analogy between these two canals than really exists, then perhaps there would be for similar conditions more of a justification in the use of the very large lacrimal probe. The anatomical surroundings, however, being so unlike in their fundamental structures and conditions, the use of the large probe or of large sounds is permissible in the one (urethra) and precluded in the other (lacrimal canal) upon a purely physical basis, if upon no other more valid one.

It is not the writer's purpose to enter into any discussion as to the relative merits of the various kinds of treatment to be pursued in cases of lacrimo-nasal obstructions. But, it is his specific desire to confine himself to such points only as have a direct or indirect bearing on the passing of any lacrimal probe.

It is not contended that a fair amount of rather rapid dilatation of a lacrimal stricture is not a good regimen, but that a rapid and excessive dilatation, as has been the vogue, is a policy to be heartily deprecated. For, the lacrimo-nasal canal permits of but a limited amount of dilatation, and beyond this point you secure a dilatation by compression which verges upon destruction of functioning tissue. The essential factor is not how large a canal can be obtained, but one how nearly physiological. The size of the canal plays no important factor in the drainage of the tears, so long as no actual stricture or other obstruction exists. Clinical demonstrations of this assertion are plentiful and self-evident. Our object should be to restore a patulous canal and interfere as little with the caliber of the canal as is consistent with this object. In the very strict sense of the term there is scarcely an actual canal, as the walls are in contact with each other on all

sides. The greatest average diameter of the canal in the cadaver is but scant 6 mm.; while in the living subject it is considerably less because of the periosteum, submucous lining, vascular network, lymph-gland supply, and the ciliated epithelium. The usual diameter of the canal in the cadaver does not exceed 3 to 4 mm., and therefore less in the living because of the anatomical structures just detailed. In view of this then, how can a sound or probe of 3 or 4 mm. diameter enter a rather tortuous canal of practically the same dimension? It cannot do so without injuring the soft tissues and thereby seriously imperiling their proper function.

The physiology of the removal of the tears will offer several additional points clearly contraindicating the use of the very large probe. The flow of tears to the nose is not a simple physical phenomenon, but rather a complicated one. Briefly stated, there are six theories which endeavor to explain this act. They are as follows: (1) The siphon theory; (2) the capillary theory; (3) the aspiration theory; (4) the sac compression theory; (5) the sac dilatation theory; (6) the lid closure theory. There are many who accept only one or the other of these theories. The writer, however, maintains that each and every one of the several methods plays a part in the conduction of the tears. Upon carefully considering the anatomy of the canal in relation to these theories of tear drainage, the use of the very large probe is, in the majority of instances, distinctly inconsistent practice. Though there are perhaps conditions arising in certain portions of the canal in which a large probe might be of some service, yet its use being injurious to a part of the canal, is of necessity so for the entire canal. This is upon the principle that which is true of the part is true of the whole. In the normal condition of affairs, the walls of the canaliculus, nasal canal, and to a certain extent the walls of the sac, are in touch everywhere. This contact of walls is obligatory to sustain the capillary theory of the downward flow of the tears. Therefore, our endeavor to establish a large and patulous canal as of necessity must follow the use of the very large probe, is certainly inconsistent with the anatomical condition. It matters not how small the caliber of the canal is, the tears will drain properly so long as no stricture or other cause

completely shuts off this little lumen. A canal as patulous as a very large probe would produce has never perhaps been seen in the living subject. Still, it is true that the calibre of the canal and the size of the lumen vary in different individuals and vary in the same canal.

The invariable slitting of the canaliculus, which is necessary in order to insert the very large probes, is an objectionable procedure. Unless there is a stricture or obstruction in the canaliculus, the slitting rather thwarts nature's effort for properly draining the tears. It destroys the even contact of the entire canaliculus with the eyeball, a very important factor. It also does away with the even pressure exerted by the lids during the act of winking which plays an important part in forcing the tears not only into the canaliculus but also into the sac as well.

Unless the whole length of the canaliculus, including its narrow opening into the sac, is cut and prevented from ever healing, the very large probe will do much damage. For, if this sac opening of the canaliculus is not cut—and it seldom is, or ever kept from healing when cut—the very large probe continually ruptures it and this finally ends in complete obliteration because of ensuing inflammation and cicatricial contraction. Unless this opening is cut, no very large probe can ever be inserted without danger. Not even rapid and excessive dilatation of the canaliculus and its sac opening will permit the entry of the classic large probe, without inflicting permanent injury. The normal calibre of the canaliculus and that produced by the very large probe have opposite tendencies in assisting the flow of tears into the sac; the former assists, the latter markedly retards the flow, because of the principle of capillarity.

In not slitting the punctum or a portion of the canaliculus, the repeated efforts at engaging the large probes will so irritate the surrounding tissues as to cause a thickening and even an eversion of the punctum. Not only this, but the passing of the very large probes without slitting punctum or canaliculus, often stretches the muscular coats so that their contracting power is forever destroyed. The same holds true for the opening of the sac into the nasal canal, as it also has a smaller calibre than the canal itself. Thus, both of these important orifices may be destroyed or obliterated be-

cause of the tearing by the very large probe producing cicatricial and granulation tissue.

In the passing of very large probes the frequent attending hæmorrhage is a serious drawback. It means that the tissues have been torn or fissured and that an inflammation will follow with a possible chance of the clot becoming organized, resulting in the formation of new strictures or an actual closure of the canal. Under these conditions one is liable to crowd and push the lining membrane in advance of the probe, either tearing it or making false passages. The constant repetition of this affair in the canal must certainly be followed by results of as grave a nature as the condition for which the probe was passed. In addition, the very large probe so crowds the ciliated epithelial lining of the canal against the bony wall as to often produce an actual necrosis in certain portions thereof. This lesion will of necessity be followed by cicatricial tissue and, perhaps, preceded by a rather violent inflammatory reaction. This ciliated epithelium is very essential, not only for the conducting of the tears, but to prevent infectious material from the nose gaining an entrance into the canal and sac. The ciliated epithelium materially assists in the capillary and suction drainage of tears into the nasal cavity.

The end result of the continued use of the very large probe is an abnormally patulous nasal canal with scarcely any normal epithelial lining. This undue size of the canal then freely admits noxious nasal secretions and thereby allows foci of infection. In addition, the frequent regurgitation of air through this canal upon blowing the nose is, to say the least, extremely annoying.

Last, but not least, is the great pain caused by passing these large probes through a canal of a smaller calibre than the diameter of the probe. This pain may last for several days and be accompanied by such an inflammatory reaction as to be quite alarming to both patient and physician.

It, perhaps, has been very apparent that no new objections to the use of very large probes have been raised. New ones are deemed superfluous, as the old ones furnish more than the requisite amount of evidence for the points at issue. Our enthusiasm has been largely responsible for the free use of the very large lacrimal probes. However, the error of our

way is gradually clearing up and the true status of the probe is near at hand. The teachings of some in this regard are receiving a severe blow from many a quarter, and deservedly so.

What has been said of the very large probe is equally true of the large style and canula. The particular shape of these large probes does not confer any special benefit as to safety or even end result. The writer is quite mindful of the fact that the admonitions given against the employment of the very large lacrimal probe are true to a limited extent for the small probe as well. The caution is: Do not use the very large probes, and the small ones as little as possible. In a certain sense, all probes are a menace.

The remarks in the paper can conveniently be summarized as follows: (1) Very large probes cause undue pain; (2) are liable to produce destruction of the membranous lining of the nasal canal; (3) are very prone to produce strictures, or at least cause undue damage to the small opening into the sac and into the nasal canal; (4) are apt to produce an unduly large lacrimo-nasal canal and thus invite infection from the nose or cause annoying influx of air into the canal upon blowing the nose; (5) necessitate undue slitting of the canaliculus, a procedure to be zealously avoided; (6) the possible obliteration of either the canalicular or nasal opening of the sac; (7) the ease with which hæmorrhages are caused in the nasal canal and the attending liability of the clot becoming organized and forming new strictures; (8) the resulting large lumen of the canal is of no actual benefit in conducting the tears to the nose.

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MEDICAL SOCIETIES.

SEVENTY-SECOND MEETING OF THE BRITISH MEDICAL ASSOCIATION.

HELD AT OXFORD, JULY 26TH TO 28TH.

SECTION OF OPHTHALMOLOGY.

First Day.

After a short address from the President, Mr. Marcus Gunn opened the formal discussion on Retro-ocular Neuritis. He described the symptoms of the disease, and insisted on the importance of the movements of the pupil. All degrees of failure of vision might be met with; the light sense was always defective, as was the power of discerning colors. The influence of the blood supply on the development of the disease was alluded to, and the great rapidity of the failure of vision was noted. In many cases recovery was remarkably good, though more rarely the prognosis was bad. Great pain and tenderness indicates a severe lesion. Pallor of the disc was unusual, though it sometimes was but very slightly marked. One great source of difficulty was the rare opportunity we get of pathological examination. Dr. Berry thought that the defect of light sense was of the greatest importance, and he relied more on this than on the actual ophthalmoscopic appearance. In the cases due to influenza there was usually defect of taste and smell. Professor Uhthoff discussed the matter chiefly from the anatomical side. Mr. Higgins related a case of well marked optic neuritis which was due to meningitis in a young lady, which proved fatal, and although the eye became blind before death no ophthalmoscopic changes were visible. The nature of the case was proved by necropsy. Mr. Richardson Cross drew attention to the importance of the peripheral fields, and said that without this he should have great hesitation in diagnosing this condition; he described some cases. Professor Oliver described the methods he used for detecting the condition, and also gave details of some cases. Dr. Hill Griffith said that some cases were due to secondary scleritis.

He thought that it was almost impossible to mistake a functional case for one of retro-ocular neuritis. He also mentioned some cases. Mr. Nettleship discussed various matters raised by other speakers. Mr. Miller read short notes of three cases. He thought that many were of rheumatic origin. Mr. Gunn replied. Professor Poulton read his conclusions as to vision of birds based upon a consideration of mimetic color and the patterns on insects. His observations led him to believe that birds saw very much the same as we do, and the things which deceived our vision also deceived that of birds. Mr. McHardy read his paper on the Maturation and Extraction of Senile Cataract, and gave his conclusions as the result of many hundreds of cases; after maturation the cortex was never sticky and always came away easily. He strongly advocated a preliminary iridectomy. If posterior synechiæ were present this was a contraindication to maturation. Mr. Higgins gave up maturation years ago, and he never found any difficulty in getting the lens away. He never did an iridectomy if he could possibly help it. Mr. Hill Griffith had performed the operation often, and thought it had no danger and much facilitated extraction. Mr. Tatham Thompson thought the need of artificial maturation had disappeared now McKeown's operation of washing out the lens was available. Mr. Grossmann and Mr. Frank Thomas spoke, and Mr. McHardy replied. Mr. Grossmann read a paper on Astigmatism with Varying Axes, and gave a lantern demonstration. Dr. Berry thought that the size and eccentricity of the pupil was the cause of varying axes of astigmatism. Dr. Bull thought that many cases were early ones of keratoconus. Dr. Grossmann replied.

Second Day.

Work began with the discussion on Intraocular Hemorrhage and Systemic Disease, which was opened by Dr. Hill Griffith. He related his experience of many cases and emphasized the apparent rarity of these cases and the importance of blood changes in their production. Dr. Lucien Howe exhibited a specimen of retinal hemorrhage. Professor Uthoff showed sections and drawings of a subretinal hemorrhage. Dr. Risley and Professor Oliver related cases which occurred in patients suffering from blood changes and

showed ophthalmoscopic drawings. Dr. George Carpenter had seen retinal hemorrhages in children in a number of different diseased conditions. Dr. Hill Griffith briefly replied and thanked the speakers. Professor Hirschberg made some practical remarks on magnet operations. He thought that the occurrence of pain on the application of the giant magnet was most deceptive, pain did not always occur even when metal was present, and in might draw it from a comparatively harmless position into the ciliary body. He urged the importance of the use of the sideroscopic and x-ray photographs. He thought we were bound to remove the splinter if it were any way possible. Dr. Barkan advocated the improved sideroscope of Professor Hirschberg. Mr. McHardy advocated the use of the x-rays before applying the magnet. Dr. Mackay urged the necessity of early removal of the foreign body. Professor Hirschberg replied, and insisted upon the great damage sometimes done by searching for a foreign body which might not even be within the eye at all. Dr. Rivers demonstrated the result of his investigation on the comparative visual acuity of savages and civilized people. He found that, apart from errors of refraction, there was hardly any difference of visual acuity, any difference there was being due to familiarity with the surroundings and education, and man all over the world had much the same vision. In tropical countries visual acuity failed rapidly after about 35 years of age. Dr. Berry read his *Remarks on the Diagnosis and Nature of Glaucoma*. He thought that the pathology of the disease was still obscure, and gave a summary of von Graefe's opinions on the subject. Dr. Berry thought that the use of miotics in simple glaucoma was useless, he had never seen sclerotomy do much good, and he had given up the performance of large iridectomies. Mr. Richardson Cross thought that in doubtful cases without inflammation cocaine should be used, and then arterial pulsation might be seen in true cases; should tension be present, operation was indicated, except in old and very diseased conditions. He thought that the continued use of miotics was useful, especially in early cases. Eserine irritation must be guarded against, and the earlier an operation was undertaken the better. Dr. Wherry and Professor Hirschberg made some

remarks; the latter condemned the operation done on the two eyes together, and thought that the irritation following the use of eserine was due to septic solutions. Professor Uththoff gave some statistics and Dr. Berry replied. Mr. Adams Frost read a paper on the Operative Treatment of Myopia. He rather tended to the opinion that retinal detachment was more frequent after the removal of the lens than before. He was averse to operating on the two eyes. Professor Landolt thought the removal of a clear lens was a dangerous procedure and that by no means had all the unsuccessful cases been published. He would operate on one eye only. Mr. Johnson Taylor thought that repeated small needlings were safer than free discission and letting out of the lens. Mr. Frost replied. Mr. Ernest Clarke read a paper on Twenty Years' Treatment of Myopia. He advocated the full correction of myopia for all purposes. Dr. McGillivray discussed the Temperature of the Cornea and its Relation to Corneal Therapeutics, and advocated the use of oily solutions of cocaine to remove photophobia.

Third Day.

The discussion on Keratitis Profunda was opened by Mr. W. T. Holmes Spicer. He found that overeating and drinking, with its accompaniments, were responsible for about three-fourths of the cases, and of those that were traced to the end the prognosis was good in all the slighter cases. The symptoms and pathology of the disease were then described, and with regard to treatment the use of atropine with hot formentations advocated, unless the tension were high, when it should be used with caution; paracentesis was the most satisfactory operation for its relief. He had never found subconjunctival injections useful; but the treatment of the general condition was most important. Mr. Power related some cases, and Mr. Cyril Walker and Dr. Hill Griffith alluded to the close simulation of these cases to interstitial keratitis. The treatment was discussed by Mr. Grainger and Dr. Koller. Mr. Spicer replied. Dr. Koller read a paper on the Subconjunctival Injection of Cocaine in the Extraction of Cataract. He found that injecting a few drops of cocaine beneath the conjunctiva did far more to anæsthetize the eye

than simply instilling it. Mr. Doyne said that he nearly always used it for enucleation. Dr. Lucien Howe demonstrated the results he had obtained from his inquiries into the time required for a normal eye to swing laterally through a given arc. The President who had been working independently at the same subject, made some remarks, and Dr. Gillivray asked if observations had been made on cases in which advancement and tenotomy had been done. Mr. Hill Griffith thought it might be useful in cases of alcoholism to measure the movements of the eyeball, and Mr. Johnson Taylor asked if it had been used in cases of nystagmus. Dr. Howe said he had not used it on alcoholics. Mr. Watson Griffin demonstrated a modified suction syringe for the removal of the lens matter after the needling of a cataract. Professor Hirschberg went into the history of suction operations. Mr. James Hinshelwood related a case of pure word blindness with right homonymous hemianopsia, with pathological examination by Drs. McPhail and Ferguson. He also described a case of congenital word blindness. Mr. Bishop Harman said the condition of congenital word blindness was well known in London schools. Mr. Stephenson did not think it was anything like so rare as was supposed, and he had himself reported 2 cases in boys. Remarks were made by Messrs. Wherry, the President, and Dr. Harris. Mr. Hinshelwood replied. Dr. George Carpenter related a case of retinitis in a child with large white kidneys. Mr. Bishop Harman read a paper on Follicular Conjunctivitis, and gave statistics he had obtained among school children. He drew attention to the influence of pediculi in the children's heads on the conjunctival condition. Dr. G. H. Burnham read a paper on Combined Treatment in Disease, especially of the Uveal Tract. This consisted of the hypodermic injection of pilocarpine and the internal administration of mercury and iodide. Dr. A. Bronner related a case of septic thrombosis of the cavernous sinus due to lateral empyema of the sphenoidal cells. The case had a fatal termination, and the results of the necropsy were given.

ABSTRACTS FROM MEDICAL LITERATURE.

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NOTES ON RADIUM.

Francis H. Williams (*Boston Med. and Surg. Jour.*, May 26) states, that physicists now consider that the beta rays from radium correspond to the cathode rays and the gamma to the X-rays. The beta rays seem likely to prove a convenient and useful remedy in certain diseases of the eye, particularly those which have not yielded to other methods of treatment. Among these are trachoma, opacity of the cornea, and inflammatory conditions of the neighboring parts. The writer has observed good results follow promptly from exposures of two or three minutes to $\frac{3}{4}$ gr. of pure radium bromide, given at first once a week and later twice a week. The radium was held about $\frac{1}{5}$ inch from the everted lid, or was placed even nearer to the closed lid opposite the diseased area. The advantages of radium over the X-rays are apparent. The output of the rays from radium is uniform, and the rays may be easily applied. The greatest care should be employed when diseases of the lids or eyes are treated with this powerful agent. Radium is also an excellent test for determining whether or not the eyes of the practitioner are in a suitable condition for making fluoroscopic examinations. The spinthariscopes containing a bit of radium is employed. If the scintillations appear bright to the practitioner, his eyes are ready for use; if dull, he must wait for a while longer in the dark room before attempting to make a fluoroscopic examination.

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ORIGINAL ARTICLES.

SAMUEL SHARP, THE FIRST SURGEON TO MAKE THE CORNEAL INCISION IN CATARACT EX- TRACTION WITH A SINGLE KNIFE. A BIOGRAPHICAL AND HIS- TORICAL SKETCH.*

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IN reviewing the history of the modern operation of extraction of cataract, beginning with the first memoir of its originator, Jacques Daviel,† first read before the Royal Academy of Surgery of Paris, on April 13, 1752, there stands before us a singularly prominent and imposing figure, that of Samuel Sharp, of London. He was a surgeon of renown, and not only did much to advance his art in general, but he also did important pioneer work in the treatment of diseases of the eye, particularly that of cataract. The latter alone, was of such signal benefit to the world that it crowns his memory with an imperishable lustre.

Sharp was born about the year 1700, on the island of Jamaica, one of the English possessions of the West Indies at that time as well as now. His family identity has not

*Read at the 9th meeting of the American Academy of Ophthalmology and Oto-Laryngology held at Denver, Aug. 24th to 26th, 1904.

†For a history of Daviel's operation see a paper by the author entitled *Jacques Daviel, and the Beginnings of the Modern Operation of Extraction of Cataract*" (*Journal of the American Medical Association*, July 26, 1902).

been recorded, but he evidently belonged to those Sharps of England who have for two or more centuries been found among her most distinguished men of letters, art and science. I am unable to find any history of the early life of Samuel Sharp. As his later life shows, he undoubtedly received a substantial education, for he wrote well, talked well, and was more or less familiar with the ancient and modern languages, having good command, especially, of French and Italian.

We come in direct touch with Sharp first, in 1724, when he was twenty-four years old. He was at this time about to prepare himself for his life-work as a surgeon. This was not done then as it is now. He was living in a different age, with different standards and amidst different surroundings. The medical profession in England had not yet outgrown mediæval ideas and customs, and it was divided into three classes, the physicians, surgeons and apothecaries, each one with its special functions and limitations. The physicians dominated, more or less, the other two classes. They were educated at the universities in accordance with the standards of the time, and occupied a dignified position in society. Very few of them "stooped" to do surgical work, most of them engaging only in the practice of "internal medicine," in obedience to the traditions of the past, when it was regarded as beneath the station of the physician to take to himself the menial labors of a handicraftsman like those of the apothecary and surgeon. On the other hand, the surgeons and apothecaries were not, in general, the learned men of the universities, but were craftsmen under the control of their guilds or "companies," acquiring their mastership and "freedom" through a stipulated term and condition of service, like any tradesmen. The surgeons, in 1724, had their "United Barbers' and Surgeons' Company" which had been incorporated by parliament, in 1540, in the reign of Henry the VIII. and which was the outcome of the union of the "Gild of Barbers," whose members did surgery as well barbery, and of the "Gild of Surgeons," of London. Both of these "companies" had existed as separate bodies for a very long time. The "United company" was organized for the purpose of assembling together, in order that "the good and due order, exercise and knowledge of the said science

or faculty of surgery shall be rendered more perfect, as well in speculation as in practice, both to (the members) themselves, and all their servants and apprentices brought up under them, * * * than it hath been or should be, if the two companies of barbers and surgeons should continue severed asunder, * * * as they before this time have been, and used themselves not to meddling together'' (The Craft of Surgery, by South and Power, London, 1886, page 100). The members of the company, however, were directed by the act that "No manner of person within the city of London or the suburbs thereof, or within one mile compass of the same, after the feast of the Nativity of our Lord God next coming using barbery or shaving * * * neither he nor they nor none other for them to his or their use shall occupy any surgery, letting of blood, or any other thing belonging to surgery, drawing of teeth only except(ed). And in like manner, whosoever useth the mystery or craft of surgery, shall in nowise occupy nor exercise the feat or craft of barbery or shaving, neither by himself nor by none other, for him to his or their use'' (Craft of Surgery, page 101). Thus were the limitations of the barbers and surgeons for the first time fixed and defined, and although united in a body for certain defensive and municipal purposes, the barber was to do nothing pertaining to surgery, except to "draw teeth," and the surgeon was not to perform any work of "barbery" or "shaving." This union would seem to be anomalous and undesirable, but it appeared to prosper and meet the needs of the community, until 1745, over two centuries, when a separation again took place, and the surgeons were organized into the "Surgeons' Company," afterwards the College of Surgeons of London, now the Royal College of Surgeons of England, and the barbers continued as before.

In the United Company was vested the power of regulating, more or less, the practice of surgery, and it was the main channel leading to security and respectability for the surgeon. London was full of unlicensed practitioners and quacks, but both the College of Physicians, which had been founded in 1518, and the United Company did all in their power to suppress them.

To become a recognized and respectable surgeon, the candidate must have served an apprenticeship of seven years, passed certain examinations, paid certain fees, and made solemn oaths of loyalty and obedience. Having been granted the diploma and "freedom" of the company, he was required to continue his relations to the company, perform prescribed duties in its behalf and attend the lectures and demonstrations given at the Barber-Surgeons' hall or, in default of this, pay a fine.

To become a surgeon the candidate, who should be at least fourteen years of age, was taken to a member of the Barber-Surgeons' Company who was in need of an apprentice, (each master being allowed to take three or four, according to his position in the company), and having agreed upon the terms of his acceptance, he was sent to the Barber-Surgeons' hall and duly presented to the court or council of the company and there examined as to his soundness of "mind and limb," and as to a sufficiency of education. If he were approved, the clerk of the company made out his indentures, which were taken to the guild hall and there registered. The lad was bound to his master for seven years (sometimes for eight or nine years). The master received a sum of money agreed upon, in return for which he undertook to supply his apprentice with "meat, drink, apparel, lodging, and all other necessities according to the custom of the City," and to instruct him in the "mysteries" and knowledge of the craft. During the time for which he was bound, the apprentice remained the slave of his master (D'Arcy Power in "How Surgery Became a Profession in London," reprint from *The Medical Magazine*, London, 1899, Page 25).

In compliance with these requirements, Samuel Sharp was "bound" to William Cheselden, of London, one of the greatest surgeons of modern times. He had taken up his residence in England, but whether with or without his parents is not recorded. His indentures were for an apprenticeship of seven years, and were signed on March 2, 1724. It appears that friends were assisting him in his new undertaking, as the fee of three hundred pounds sterling (\$1,500.00), was paid by Mrs. Elizabeth Sale, "a widow living in Hertford." Just how Sharp was employed or what studies he

engaged in during his apprenticeship can only be conjectured. There is reason to believe, however, that his master had great regard for him and gave him the best advantages of the time. Cheselden (born Oct. 19, 1688, died April 10, 1752), himself, coming from a wealthy family, had had an excellent training. He had a classical education, and had been the house-pupil of William Cowper, the anatomist. Moreover, he was highly endowed intellectually, and was a man of great energy and high ambition. As soon as he had obtained the "grand diploma" of the Barber-Surgeons' Company, in 1711, he began lecturing on anatomy. These lectures were delivered at first, perhaps, at the Surgeons' Hall, where a lecturer was, by special permission, allowed to teach a small class, after he had performed his public duties, and from time to time, as opportunity occurred, "a private anatomy was wrought upon" (Power, reprint cited, page 29). These lectures were continued at his house, and afterward, for twenty years, at St. Thomas' Hospital, to which he was appointed in 1719. The lectures were on anatomy, and were published in book form in 1713. This work afterward passed through many editions. Besides his appointment at St. Thomas', he was surgeon at the Chelsea Hospital, and on the foundation of St. George's, in 1733, he was appointed one of its surgeons. Besides his hospital appointments he was made surgeon to Queen Caroline, in 1728, and by his many talents became a welcome guest in the highest social and literary circles. He was a member of the Royal Society, and was an intimate friend of Alexander Pope, the poet, Jonathan Richardson, the painter, and Sir Hans Sloane, the naturalist and founder of the British Museum. Such being the activities and relations of the master, naught but intellectual and social advantage could accrue to the favorite pupil. Undoubtedly, Sharp had the opportunity of attending Cheselden's anatomical lectures, and also of seeing his extended hospital work and assisting in it. It was at about this period (1723-1727), that Cheselden was studying and perfecting his operation of lateral lithotomy, which he executed with such extraordinary skill, brilliancy, and success, even on one occasion extracting a stone from the bladder, it is said, in fifty-four seconds. He became so famous in his operation,

that surgeons came from all over Europe to witness his performance of it, and to learn his method. The French Academy of Sciences became much aroused over the operation, and delegated M. Sauveur-François Morand, one of its distinguished members, to go to London, and study it. This visit led to a lasting friendship between the two great surgeons, the fruits of which were an advancement, by interaction, of both English and French surgery to an extent that never can be measured. The interchange was such that all that was best in England went to France, and all that was best in France came to England.

Sharp was at this time presented to Morand while he was in London, and through this acquaintanceship he afterward went to Paris to study surgery even before he had completed his apprenticeship with Cheselden. More than this, Morand later became the warm friend of Sharp, and did much to promote his interests, as well as those of Cheselden, in the Royal Academy of Surgery of Paris, of which both became members, Cheselden, in 1743, and Sharp, in 1749.

Not only did Sharp have the benefit of the acquaintanceship of Morand and other French surgeons, but he counted it one of the privileges of his life to know the celebrated Voltaire and to have social intercourse with him. This acquaintanceship began while Voltaire was living in London during his exile from France, in 1726-1729*, and was continued in Paris, as Sharp was frequently the guest of Voltaire while he was studying surgery there, probably in 1730, as well as later in life.

With all the opportunities which Cheselden was able, and undoubtedly disposed to give his pupil, and with all the advantages which were to be derived from the work and standing of the master, Sharp made creditable progress in his studies, and on March 7, 1731, was admitted "freeman" of the Barber-Surgeons' Company. Imbued with the spirit of his master, his ambition led him to go farther, and after

* "I knew him in the days of my youth, and had the honor to be sometimes with him when he was in London. I also saw him in Paris in 1749. . . . I remember to have heard him say, about the year 1726, that before he learnt English he read the *Spectators* in French and often wondered that such dull writings should please a polite nation. 'But now,' said he, 'that I have acquired the tongue,' etc." Sharp's *Letters from Italy*", Second edition, pp. 2 and 4.

practicing a year and demonstrating to the Company his high proficiency, he was granted the "grand diploma", which entitled him to be called a master in surgery and anatomy, and allowed him to practice his art anywhere and during his whole life (Power, reprint cited, page 26). This diploma was obtained on April 4, 1732, and on June 6, the same year, he "was admitted into the livery and clothing of the Company."

Thus did Samuel Sharp prepare himself for his chosen calling and equip himself for its duties. Ambitious, intelligent, energetic, he made the most of the opportunities which his great master had offered him, and began the practice of surgery under auspices most favorable to success. Cheselden's friendship was so great for the man who had assisted him so materially in his lectures, in his operations, and in preparing and publishing those plates of such extraordinary beauty and excellence, comprised in his famous work known as "*Osteographia*," that his kind offices in Sharp's behalf did not cease when he was no longer his master, but they were continued for many years afterward. In many ways was Cheselden's powerful influence cast for Sharp. This was especially notable in the year 1733, the year of the publication of Cheselden's "*Osteographia*," and did much to give Sharp a foothold on the surgical practice of London that was sure, and to secure a start in a career that became distinguished and productive of great professional good.

Guy's Hospital had been opened in 1725, and its administration had been patterned largely after that of its more ancient neighbor, St. Thomas'. The medical and surgical staffs of both institutions, also, were so closely related that for many years they were practically one. The first surgeons appointed to Guy's were Francis Croft and Andrew Cooper. Croft resigned in 1727 and Robert Baker succeeded him. Cooper resigned in 1732 and Hasell Cradock was appointed to his place. Baker served the hospital four years, retiring in 1733. Here was an opportunity for Sharp, and both he and Cheselden, then of St. Thomas', saw it. Sharp had been practicing two years and was now in position to assume hospital responsibilities on his own account, and he desired the place made vacant by Baker's resignation. Cheselden's influence here became paramount, and Sharp was elected

surgeon to Guy's on August 9, 1733, in association with Cradock. This association, however, was of rather short duration, as the latter died in 1736. John Belchier, a friend of Sharp, about four years his senior, and also an apprenticed pupil of Cheselden, was appointed to Cradock's place. Sharp and Belchier remained colleagues in the hospital until 1757, when Sharp resigned. Belchier, who was a man of some note, did not retire till 1768.

From the moment of Sharp's appointment to the hospital in 1733, his practice began to grow, and it rapidly increased till soon it became large and lucrative. Following the example of Cheselden, he instituted a private course of lectures to a society of navy surgeons, which he delivered in Covent Garden. Such lectures were somewhat of an innovation on the customs of the time, but they were accepted and tended to increase Sharp's popularity. They constituted a "course of anatomical lectures to which were added the operations of surgery with the application of bandages." In 1746 he was so much occupied by the increase of his work that "for want of leisure" he resigned his lectures to William Hunter, then a surgeon, who continued them, and in whose hands they became the nucleus of that celebrated school of medicine of the eighteenth century, known as the "Great Windmill Street School," which is thought by some to have laid the foundation of modern medical teaching.

Soon after Sharp's appointment to Guy's Hospital, he received an apprentice whose relations to him and to the hospital proved of great service both to himself, the hospital and the profession. This apprentice was Joseph Warner, who, like himself, was born in the British West Indies, in Antigua, and from there was sent to London to be educated. In 1734, at the age of seventeen, he was bound to Sharp. He was at once allowed to assist his master at Guy's, and to attend Sharp's lectures on anatomy and surgery. Having finished his apprenticeship and entered into the practice of surgery, a vacancy occurred in the hospital staff by the death of James Pierce, in 1745, who had just been made its third surgeon, and he was appointed to his place. By this appointment Guy's had three surgeons, all of whom honored the institution and distinguished themselves. These were Sharp, his fellow apprentice under Cheselden, Belchier, and his own

pupil, Warner. With such men as these in the surgical department, it is no wonder that Guy's Hospital rapidly rose to the first rank among the hospitals of London. Sharp's pupil, moreover, carried forward those innovations and improved methods which Sharp had introduced, and thus perpetuated the results of his labors.

In the course of time, Sharp had so far risen in the esteem of the learned of London that he was deemed a worthy candidate for fellowship to that very exclusive and select body of savants, the Royal Society, and in 1749 he was taken into its fold. During the same year he made another visit to Paris, where he was received with open arms. Here he studied, carefully, the latest methods and improvements of the French surgeons, and at the same time was honored by being elected a foreign member of the Royal Academy of Surgery of Paris, another body of limited and select membership. Here his acquaintance and friendship with Morand, the perpetual secretary of the Academy, proved of signal service. On his return to England he wrote a book, "*A Critical Enquiry into the Present State of Surgery*," in which he reviewed contemporary practice and embodied his observations on the practice of the surgeons whom he had met.

Sharp's practice in London now assumed very large proportions. The demands which were thus made upon him, together with a life-long affliction of asthma, induced him, after twenty-four years' service, to relinquish his hospital work. He tendered his resignation to Guy's on September 23, 1757, but continued to practice until 1765, when, on account of ill health, he went to Italy, where he spent a year in travel. While in Italy he wrote a series of letters, fifty-four in all, to a friend in England, describing the manners and customs of the inhabitants of the various provinces which he visited, and giving his impressions of them. These letters, even to-day, are deeply interesting, and at the time of their publication in book form, in 1766, and a second time in 1767, they aroused a good deal of feeling among the Italians.* Barretti, in answer to Sharp, published a work

* Dr. Samuel Johnson, the learned contemporary of Sharp, said: "I read Sharp's letters on Italy over again when I was in Bath. There is a great deal of matter in them."—*Boswell's Life of Johnson*, by Crocker, page 512.

in two volumes entitled "An account of the manners and Customs of Italy," which passed through two editions. In this he criticised Sharp severely. In 1768 Sharp defended himself in another publication which he entitled "A View of the Customs, Manners, Drama, etc., of Italy, as They Were Described in the 'Frustra Litteraria.'" In this Sharp unearthed a number of contributions by Barretti, containing similar censures to his own. It is generally conceded that Sharp did not in the least exaggerate the condition of the people with whom he came in contact, and that the honors of the controversy fell upon him.

Before the publication of his "Letters from Italy," and the book in answer to Barretti, Sharp had made important contributions to the professional literature of his day. His first book was issued in 1739, and was undoubtedly the outcome of his series of lectures to navy surgeons already referred to. It was entitled "A Treatise on the Operations of Surgery, with a Description of the Instruments Used in Performing Them: To which is Prefixed an Introduction on the Nature and Treatment of Wounds, Abscesses and Ulcers." He dedicated his work to William Cheselden, his teacher and friend, as follows: "As I am chiefly indebted to the advantage of an education under you, for whatever knowledge I can pretend to surgery, I could not in the least hesitate to whom I should dedicate this treatise: though was it my misfortune to be a stranger to your person, that merit which has made the world so long esteem you the ornament of your profession, would alone have induced me to show this mark of my respect, which I hope will not be unacceptable."

In his preface he says: "It has been very much my endeavor to make this treatise short: and therefore I have given no histories of cases, but where the uncommonness of the doctrine made it proper to illustrate it with fact, and these I have recited in the most concise manner I was able. On this account, too, I think I have not attempted to explode any practice which is already in disrepute." In following out this plan of limiting himself to the statement, in as few words as possible, of the "distinguishing appearances" of surgical diseases, and the methods of treatment which he approved, he gave to the profession a most acceptable treatise. The

first edition of 1739 was followed by a second in 1740, and in 1782 there had been ten English editions, and one in French, in 1741.

Sharp's next literary undertaking was his "Critical Enquiry into the Present State of Surgery." He published this in 1750, soon after his visit to Paris in 1749. In this work he says in the preface, "I have only considered either such doctrines which, though generally received, are in my opinion ill-grounded, or such improvements as are yet little known." In this "Enquiry," there are over three hundred pages of "criticisms" on the surgical practices of the time, particularly of the Parisian surgeons, together with statements of his own conclusions and methods. This book, like the previous one, was concisely and clearly written, and was well-received, both by the English and the continental profession. It passed through four English editions up to 1761, and translations of it were made into French, in 1751, into Spanish, in 1753, into German, in 1756, and into Italian, in 1774.

Besides these works on general surgery there were published three papers which Sharp read before the Royal Society of London. The first one was very brief, and was on "Experiments Concerning the use of Agaric of Oak in Stopping of Hæmorrhage," and was read December 14, 1752, and published in the *Philosophical Transactions*, Volume XLVIII, Part II, for the year 1754 (London, 1755, page 588). The second paper was also brief and was read before the Royal Society on April 12, 1753, and was entitled "A Description of a New Method of Opening the Cornea, in Order to Extract the Crystalline Humor." It was published in Volume XLVIII, Part I, for 1753, of the *Philosophical Transactions*, London, 1754, page 161. On November 22, 1753, he read another paper before the same body on the same subject entitled, "A Second Account of the New Method of Opening the Cornea, for Taking away the Cataract." This was also published in Part I, of the same volume, page 322.

Sharp, it appears, did not practice long after his return from Italy in 1767, but, having acquired a large fortune by his profession, and being a chronic invalid, retired at about that time or perhaps soon afterward. He lived, however, to

an advanced age, dying on March 24, 1778, nearly eighty years old.

Not only was Sharp recognized as a great and skillful general surgeon, but he took highest rank as an ophthalmic surgeon. His services were sought by all classes afflicted with diseases of the eyes. The celebrated Dr. Samuel Johnson, of his time, typifies the confidence that was thus reposed in him. His friend, Mrs. Anna Williams, had cataracts, and at his request Miss Hawkins took her to Sharp (in 1751) who had said he "would couch her gratis, if the cataract was ripe; but upon making the experiment it was found otherwise and that the crystalline humor was not sufficiently inspissated for the needle to take effect" (Foot-note to page 74, Boswell's *Life of Johnson*, by Croker). Again, in a letter dated October 18, 1760 (same work, page 121), Johnson says: "I am very solicitous for the preservation or curing of Mr. Langton's sight, and am glad that the chirurgeon at Coventry gives him so much hope. Mr. Sharp is of the opinion that the tedious maturation of the cataract is a vulgar error."

In taking special notice of Sharp's contributions to ophthalmology, we find that they were not numerous, but that they were important as bearing upon the opinions and practices of the time, especially those pertaining to the extraction of cataract. The true nature of cataract had become generally recognized long before Sharp began his rôle as an author. This knowledge, however, had not changed its treatment, and couching was still accepted as the standard operation when he wrote his "Operations of Surgery." This operation he himself practiced and described, and he offered some suggestions as to how it might be improved. The chapter embodying this description also gives the symptoms, diagnosis and varieties of cataract, clearly, and for the most part accurately, excepting that he said that "the glaucoma was no other disease than cataract." He took cognizance of the complications and sequelæ that followed the operation, and among them the closure or obscuration of the pupil. He had become familiar with the operation for making an artificial pupil in such cases, as practiced by his master, Cheselden, and as described and published by the latter in the *Philosophical Transactions*, Vol. XXXV, 1728, page 451. In his

"Operations of Surgery," Sharp gives an entire short chapter to "Cutting the Iris," and details Cheselden's operation, adding such improvements as he had devised. He notes the conditions in which the operation "may be of some service," and says that one is "when the cataract is from its adhesions immovable; and the other when the pupil of the eye is totally closed up by a disorder of the muscular fibres of the iris, which, gradually contracting the orifice, at least leaves the membrane quite imperforate." In doing the operation, he seated the patient in the same way as for couching, and used a knife resembling a narrow lancet, with two edges. This knife being introduced "in the same part of the conjunctiva you would in couching, insinuate it, with its blade held horizontally and the back toward you, between the ligamentum ciliare and circumference of the iris, into the anterior chamber of the eye; and after it is advanced to the further side of it, make your incision quite through the membrane; and if the operation succeeds, it will, upon wounding, fly open, and appear a large orifice, though not so wide as it becomes afterwards. The place to be opened in the iris will be according to the nature of the disease: if the membrane itself be only affected with a contraction, the middle part of it, which is the natural situation of the pupil, must be cut; but if there be a cataract, the incision must be made above or below the cataract, though I think it more eligible to do it above." He then pointed out the contraindications for the operation, and the dangers that frequently attend it. In later editions of his "Operations" he said that "since it has been discovered by the extraction of the crystalline (lens) that a large wound may be made through the cornea without any bad consequence, I should imagine this operation would be much improved by introducing the knife perpendicularly through the cornea and iris, and cutting both at the same time, so that the incision of the iris should be exactly in the same part and of the same dimensions as by the other method."

Thus did Sharp endorse and popularize his master's operation for artificial pupil, and improve upon it, and thus was strengthened and made more secure the foundation for the modern operations of iridotomy and iridectomy.

Another condition which attracted the close attention and judicious consideration of Sharp was "fistula lachrymalis." It was a disease that had long baffled the efforts of surgeons, and he set himself the task of improving upon the prevailing methods of treating it. His "Operations" contains a long chapter on the subject, and after reviewing its symptoms, "nature," and the usual treatment, he suggests the discarding of "fire" (the actual cautery) "in all the stages of it." He treats it by incising the abscess or "fistula," keeping the sac open by dossils of lint, and probing the nasal duct, through the opening into the sac, at each dressing, and when the suppuration diminishes sufficiently he allows the opening to close by granulation, and by using gentle pressure over the sac by means of a special instrument which he devised for the purpose. When the bone was bare, he used a "perforator," carrying it through the duct well "towards the nose," and then treated the case as before, by dossils of lint, probing, cleansing and, later, compression. This treatment was far in advance of that by the cautery, then so much in vogue.

In 1750, when he brought out his "Critical Enquiry into the Present State of Surgery," he again referred to fistula lachrymalis, and said that "an ingenious surgeon," Monsieur De la Forest, had showed him when in Paris, in 1749, "a new way by which he declares he had cured several fistulæ lachrymales without making an incision into the saccus lachrymalis." This consisted in making injections upward through a canula passed from the nostril through the nasal duct into the sac, or by means of a syringe alone. Sharp found the method difficult to execute.

The next ophthalmic contributions by Sharp were the two papers already referred to which he read before the Royal Society on April 12 and November 22, 1753, respectively, and published in 1754 in the "Philosophical Transactions," as above stated. These papers were on "A New Method of Opening the Cornea" in the extraction of cataract, and in the history of the operation of extraction of cataract have an importance second only to the immortal "invention" of Daviel, the originator of the modern operation. Although they were read in 1753, they were not published till the

following year. Their subject was new among surgeons, and made a profound impression. Daviel's operation was being discussed with much warmth in France, but had received little attention in England. Sharp was always abreast of his time, and as a member of the Parisian Royal Academy of Surgery, and as a personal friend of Monsieur Morand, its perpetual secretary, he very likely knew in the main what was taking place in that progressive body. Daviel's memoir, according to the custom, had been read twice before the Academy, once on April 13, and again on November 16, 1752, and de la Faye, a distinguished French surgeon and a member of the Academy, had also during the winter of 1752-3, soon after Daviel read his paper the second time, presented a knife which he proposed to substitute for Daviel's triangular knives and scissors in making the corneal incision in the operation of extraction of cataract. Daviel's memoir was published in abstract, at the time it was read, in the *Mercure de France*, but de la Faye's suggestion was not made public till late in 1753 or early in 1754, when Tome II of the "Mémoires de l'Académie de Chirurgie Royale" was published, and was included in his memoir on extraction of cataract, and must have been after both of Sharp's papers had been read before the Royal Society of London. While, therefore, de la Faye, in November, 1752, had publicly described a single knife for making the corneal incision, he had not then used the instrument on the living subject, and did not do so, as he himself says, until June 11, 1753, when he "performed this operation on six persons" (See de la Faye's Memoir in Tome II of "Mémoires de l'Académie de Chirurgie Royale," page 563). It is barely possible that Sharp knew something about de la Faye's knife through Morand, with whom he held correspondence, but this is made doubtful by the fact that in his second paper before the Royal Society (Nov. 22, 1753) he says that Daviel "*is the only writer who has treated the subject (extraction of cataract), at least that I am acquainted with.*" I therefore flatter myself that this attempt to improve upon what he has laid down will not be construed as a reflection on him or his practice. For, however his invention may be perfected by others, in my opinion, it is still to him, principally, that the world will be indebted for the benefit of the discovery."

The knife which de la Faye had presented to the Academy was, as he says, "a species of small bistoury, fixed in its handle, its blade very thin, a little convex on its flat, and twenty to twenty-one lines long and two lines wide at its greatest width. It is edged only on one side, except at its point where the back is also edged, but only for about two



FIG. 1.—The knife of de la Faye. The upper line shows the "convexity" of the blade on its flat. From *Mémoires de l'Acad. de Chir.*, 1753, tome II.

lines. The point and the whole edge have the fineness of the point and edge of a lancet. * * * The handle is three inches and nine lines long by four lines in diameter." "The blade is slightly curved on its flat so as to keep the point away from the iris in traversing the anterior chamber" (See Fig. 1).

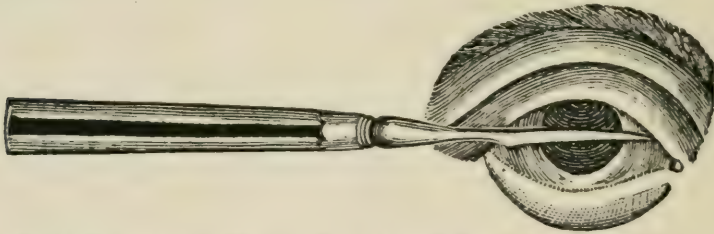


FIG. 2.—Sharp's knife. From original cut accompanying his first paper.

The knife of Sharp had no resemblance to that of de la Faye. It was "a small knife a little larger than an iris knife" (*Critical Enquiry*, third edition, page 252). It was straight on its flat, somewhat convex on its back, slightly concave on its edge, a little less than an inch long, and at its heel about



FIG. 3.—Another illustration of Sharp's knife. From tome II of *Mémoires de l'Acad. de Chir. Royale*, 1753.

one-eighth to one-sixth of an inch wide, tapering gradually to a fine point. It is figured in Sharp's first paper (Fig. 2) and also in Tome II of "*Mémoires de l'Académie de Chirurgie Royale*," 1753, in connection with a figure of the knife of de la Faye (Fig. 3). Sharp first used his knife on April 7,

1753, and before June 11, 1753, when de la Faye first used his on the living subject, he had made seven extractions with it. Previous to Sharp's first operations, no other surgeon had used a single knife for the same purpose, although it was not long afterward when, besides de la Faye, Poyet, a young Parisian surgeon, offered one (Fig. 4) which had little to commend it, and which was never adopted by other surgeons (*Mémoires de l'Académie de Chirurgie Royale*, Tome II, page 353). While, therefore, the priority of suggestion may be claimed to belong to de la Faye, the priority of *use* incontrovertably rests with Sharp. He had, as he says, "used the scissors as Mons. Daviel directs" (second paper, *Phil. Trans.*, Vol. XLVIII, page 327). He experienced the inconveniences of Daviel's multiplicity of instruments. His originality and mechanical turn of mind led him to devise a remedy, and his knife and his operation, both of great perfection, were the result.



FIG. 4.—Poyet's knife. From *Mémoires de l'Acad. de Chir.*, 1753, tome II.

The first paper of Sharp on opening the cornea was very short, and is worthy of further record at this time. As originally published in the *Philosophical Transactions* (Vol. XLVIII, page 161), it was as follows:

"The operation of discharging the crystalline humor from the eye, for the cure of that species of blindness called a cataract, was a few years since invented by M. Daviel, who has performed it on great numbers of patients, and continues still to practice it with remarkable success, as I have lately learned from unquestionable authority (M. Morand, perpetual secretary of the Academy of Surgery at Paris). Supposing it therefore admitted, that the extraction of the crystalline humor has been found by experience to be a useful method of cure, I here take the liberty of laying before the Society a new manner of making the incision of the cornea, by which, I flatter myself, M. Daviel's operation will be very much shortened, the patient will suffer less pain, and every skillful operator will be equal to the undertaking.

"Place the patient in the same situation as for couching,

either opening the eyelids with your forefinger and thumb, or letting an assistant raise the upper eyelid, while you yourself keep down the under eyelid. Then, with a small knife, the figure of which is here represented (Fig. 2), holding its edge downwards, make a puncture through the cornea near its circumference into the anterior chamber of the eye, in such a direction, as to carry it horizontally, and opposite to the transverse diameter of the pupil: after which you are to pass it towards the nose, through the cornea from within outwards, as near to its circumference as in the first puncture.

“When you have made the second puncture, push the extremity of the blade one-seventh of an inch beyond the surface of the cornea, and immediately cut the cornea downwards, drawing the knife towards you as you make the incision. After this, you press gently with your thumb against the inferior part of the globe of the eye, in order to expel the cataract, and the operation finishes, according to the different circumstances, as in the manner proposed by M. Daviel.

“One extraordinary benefit seems to arise from the use of this single instrument, and perhaps from the shape of its blade, which increases in breadth all the way towards the handle; for, by this means, the punctures are so exactly filled up by the blade, that very little of the aqueous humor is discharged before you begin to make the incision, and consequently during this time, the cornea preserves its convexity: whereas by using one instrument to puncture, and others to dilate, the cornea immediately becomes flaccid, upon the issue of the aqueous humor, and renders the operation tedious and embarrassing, as I myself have found by experience in one patient, on whom I performed the incision of the cornea with a pair of scissors, as recommended by M. Daviel.”

This contribution needs no comment. It is one which not only exemplifies Sharp's incisive and comprehensive manner of expression, but in its subject-matter and surgical procedure is an epoch-making document. It gives recognition to the value of the great “discovery” of Daviel, refers to its drawbacks, and describes his own method of remedying them. His new experience was slight, but his surgical sense and genius had elaborated almost a model operation. It was in fact, even in its beginnings, the same incision as is made to-

day, being directed downward, instead of upward, as Schweigger and others still prefer to do in many cases.

Sharp's second paper is a continuation and augmentation of the first, and embodies the records of all the cases upon which he had operated with the knife, and the conclusions which an increased experience had suggested to him. As already noted, this paper was read November 22, 1753, and up to this time he had undertaken to make nineteen extractions. These were done between April 7 and October 22 of that year. After listing them he says: "The state of the success stands thus: AC, AD, AF, AG, AL, all of which had the operation performed on both eyes, have every one of them recovered the sight of both eyes, to as great a perfection as can be supposed, without the help of the crystalline humor; that is, they can read and write with proper spectacles. The first of them, AC, has found so much benefit, as to be able to carry on the exercise of his profession, that of a surgeon.

"AH sees with both eyes, but not so well as the other five. I have just now an account from the surgeon, who has attended her (in a distant country), that her eyes look well and her sight improves.*

"AI, another patient at a distance from London, had the operation done on one eye only; which he recovered, as my correspondent informs me, so as to see tolerably well. AM, on one eye only, with which he already sees very well. AE had it performed on both; one of which was lost, and the other recovered; but continues inflamed, and cannot bear much light. AB had it done on one eye only, which was lost.

* * * The ill success was partly owing to the imperfection of my instrument, a disadvantage that must frequently attend on the execution of new attempts. It was the first operation I performed, and I had provided a knife with so thin a blade, that, after I had passed through the cornea into the anterior chamber of the eye, the point was so blunted, that, upon endeavoring to carry it through the cornea out on the other side, the blade bent, and I was apprehensive it

* Some weeks after this paper was read, Mr. Sharp received an account that the pupils of both eyes had lately contracted so much as hardly to leave room for the admission of light, and it was apprehended the patient would soon become blind.

might break. However, withdrawing it a little, I made two or three efforts, and succeeded in the incision, and the removal of the cataract. During this operation, the aqueous humor being discharged, and the patient struggling, I wounded the iris, which bled profusely, and continued several days to discharge a great quantity of blood and bloody ichor: and it is to this accident that I am inclined to impute the miscarriage of the operation."

In the case of AK, there was "the appearance of a beginning cataract, being of a light blue, and but little opaque." Sharp attempted to extract both lenses but failed in each, even after cutting through the capsule with the point of his knife, and subsequently passing the curette "through the pupil and turning it several times round in the expectation of breaking the capsula," but without "the least resistance." "Both operations proved ineffectual, the circumstances being exactly the same in each eye." The lenses receded into the vitreous humor, and much of the latter was discharged.

Thus out of the nineteen eyes operated upon, thirteen results were good, two were questionable, the sight at first being good, but deteriorating later, and four were failures, one of these following an accident with the knife, one from inflammation, and two from inability to extract the lenses. Extraction was really made in seventeen eyes, and two of these were lost. In a new field like this, such a result can but be looked upon as a great surgical triumph. Sharp operated without fixing the eye, without any form of speculum, and delivered the lens without opening the capsule. In one case, however, AC, the lens "from mere pressure in the operation, burst out of its capsula, which I left in the eye; but in some weeks it entirely wasted." In his first operations he delivered the lens by compressing "the inferior part of the globe of the eye with his thumb gently." But noticing that some force was required to expel the lens and that "it sometimes suddenly drew after it a portion of the vitreous humor, I changed my method, and no longer pressed the eye when once the crystalline was in the anterior chamber, but immediately stuck the point of my knife into the body of it, and extracted it contained in its capsula, without spilling any of the vitreous humor. This new process, I

suppose, will be found of considerable advantage as it will, in a great measure, remove the danger of evacuating the whole or too much of the vitreous humor: though it may be observed, to the praise of this operation, that, contrary to expectation, a large quantity of this humor (perhaps a third part or more) has sometimes been discharged without any bad consequence." This new procedure would also, he thought, do away with the difficult and, to the patient, "fatiguing" method of Daviel in which he "advises the flap of the cornea to be suspended with a small spatula, then with a pointed, cutting needle to wound the surface of the crystalline; after which to introduce the same spatula through the pupil in order to detach the cataract from the iris, and then proceed to the expulsion." Sharp believed it better to remove the capsule with the lens, although not absolutely necessary. If in the future its removal should be found necessary, he thought it might be done with Daviel's curette. "This instrument may also be used for the extraction of a cataract which has been broken to pieces by the couching needle in a former operation," as well as for detaching adhesions of the iris to the lens.

In regard to the speculum, he said: "I should not be surprised if the use of a *speculum oculi* should hereafter be esteemed an improvement: but then it must be contrived so as that it shall not compress the globe of the eye; or, if it does, the operator must be careful to remove it the instant the incision is making, lest by continuing the pressure after the wound is made, all the humors should suddenly gush out."

In none of his cases, "either during the operation or after the operation," had the iris "been pushed forwards, or insinuated itself through the wound of the cornea, forming a staphyloma," such as Daviel had met with. In all of Sharp's cases he thought there was inflammation. He regarded this as being due to incision of the cornea, and contrasted it with the great number of cases of couching in which there was neither pain nor inflammation. The inflammation, however, in his extractions was not always severe, and while characterized by tenderness, pain was generally absent, even when there was swelling of the lids and con-

junctiva. "None suffered very much in particular, except AE. who was extremely bad, and lost the eye on the left side, where the pain was."

Sharp was not oblivious to cases of cataract which were not suitable for operation, and called attention to the "possibility of an incomplete gutta serena being complicated with cataract. * * * When a cataract is thus circumstanced, the operation will be fruitless."

After thus detailing his experience and adding suggestions, he says: "I presume a greater number of operations will prove this account very deficient: but I have here communicated all that I have done, and all that I know on the subject, not having suppressed one experiment, nor, to the best of my remembrance, one circumstance, either to the honor or disgrace of the operation."

Sharp not only showed and demonstrated his instrument at home, but also during the summer of 1753 sent one to his friend, Morand, at Paris, who exhibited it to the Parisian surgeons interested in the subject, and inserted a cut of it in the "Mémoires" of the Royal Academy of Surgery, with one of de la Faye (Fig. 3). In Paris it was respectfully received, and his device and experience were a great stimulus to the appreciative minds of the Frenchmen.

In 1754, when the third edition of Sharp's "Critical Enquiry" was called for, he again took up the operation of extraction of cataract, and set apart a whole chapter to the subject, embodying the substance of his previous papers, with such additions as seemed to be justified by his continued experience. He opens the chapter by stating that a new method of treating cataract had lately been attempted by Daviel, of Paris, which had been attended with considerable success, but that he employed a great number of instruments. "As," he says, "his method seems capable of great improvement by being rendered more simple, I have abridged it, and practiced it myself upon several people." He then proceeds to describe his own operation, and the difficulties and complications attending it. In some respects he added very materially to what he published in his papers read before the Royal Society. His further experience had given him clearer notions both of the manner of performing the operation and

of the conditions of healing. The whole chapter merits the attention of the ophthalmological historian, but the following extracts are of most interest. After repeating the description of the operation substantially as given in his first paper, the incision being placed in the lower half of the cornea at its "circumference," he says: "This wound will be almost semi-lunar, and nearly parallel to the inferior half of the circumference of the pupil, so that the cicatrix will obstruct the light but very little. M. Daviel recommends an incision of nearly two-thirds of the circumference of the cornea, but I believe what I mention will be found more commodious, and so large a wound as he directs is apt to give issue to the vitreous humor." In regard to the escape of the vitreous humor and its management he suggests that "it might be owing to a convulsive contraction of the muscles surrounding the globe of the eye during the operation. When this is the case the surgeon must instantly shut the eyelid to prevent the total evacuation of the vitreous humor, and at the same time both he and the assistant cease to press upon the eyelids. But if the crystalline (lens) does not immediately rush out of the eye, the operator must press gently with one or two fingers against the inferior part of the globe, till the crystalline advances through the pupil into the anterior chamber from whence it will generally fall through the wound of the cornea upon the cheek. However, should it not readily fall out of the eye, but remain lodged in the anterior chamber, I would advise the operator not to press the eye in order to expel it, but immediately to stick the point of the knife into the body of it, and extract it contained in its capsula." He laid much stress on this maneuver and enlarged upon the benefits to be derived from it, as in his second paper before the Royal Society. Sharp continued to advise the removal of the cataract with its capsule, but if this were not always practicable, he believed that the capsule "probably will waste: for in milky cataracts, when the fluid is discharged, the membrane at length wastes." Further on, however, he modifies this statement by saying "that probably one cannot always certainly judge at the time of the operation, whether it (the capsule) be taken away or whether it remain: for I suppose that the membrane at the time of the

operation may be transparent and afterwards become opaque, and if this conjecture be well grounded, the operator will not be able to discern it, though it should remain. * * * However, it is a matter of no consequence, whether the remaining capsule be discernable or not, if it be disposed to waste afterwards, as my experience hitherto has proved it." It is now known that Sharp was mistaken in this, as the capsule does not absorb. Sharp further argues for the use of the curette "in removing the capsule," both after the ordinary extraction, and after the fluid of a "bag-cataract" has been discharged, and also in "detaching the crystalline from the back of the iris, when any portion of it happens to adhere, which circumstance would render the operation fruitless without such a precaution." Again the curette is useful in "taking away the fragments of a cataract when in pieces."

The proper length of the corneal incision had become a matter of great concern in Sharp's later experience. "If it be too large," he says, "all the humors are subject to be voided; if too small, the aqueous and vitreous will rush out upon pressure, and the crystalline will remain behind * * * It is, therefore, a precaution of the highest importance not to exert much force in pressing the eye after you discover that the incision of the cornea is too small, but in that case to enlarge the wound sufficiently with a convenient pair of scissors, and then proceed to the expulsion of the cataract. Could we safely make use of a *speculum oculi*, perhaps this difficulty in making a proper incision of the cornea might be diminished; and I am inclined to think that with due attention it might be employed; but then it must be contrived so, as that it shall not compress the globe of the eye," repeating his former statement in regard to it. Speaking further of the incision he says: "A man that practices the operation on a dead body will wonder at the difficulty I have supposed in making this incision; but when an eye is in a convulsive motion, and the eyelids are almost shut, as it often happens in the operation, the case is very different. The most material instruction I can give on this head is to make the first puncture through the cornea with quickness; because when your knife is once through the cornea, it gives you some command of the motion of the eye; but if you attempt to

penetrate the cornea gently and gradually, the eye, upon the first sensation of the puncture, will suddenly retire from the knife, and the operator will be apt to carry it betwixt the laminae of the cornea, or through the cornea upon the iris, either of which accidents would incommode, if not defeat, the operator."

He again refers to accidents and sequelae and repeats that he has not had protrusion of the iris through the wound as had happened with Daviel who said "it may easily be replaced by the spatula." "It seldom or never happens that the patient escapes an inflammation in this method of removing the cataract." Here, probably, Sharp mistook the reaction which normally follows an operative traumatism for an undesirable pathological process. In some of his cases, however, the inflammation undoubtedly exceeded the "normal" limits. In his opinion, "there is one great evil to be apprehended from a violent and tedious ophthalmia after this operation, and that is, an inflammation of the iris, which I have seen in two patients bring on such a contraction of the pupil, as in time to close it, and have no passage for the admission of light. Some alteration in the shape of the pupil after this operation is exceedingly common; but the mere loss of its circular form is no impediment to the sight. This change of figure in the pupil is supposed to be owing, either to its sudden dilation from the rapid motion of the cataract, when expelled, or to some violence done to it by the knife during the operation; but it is not improbable that the inflammation of the iris may also sometimes produce this effect."

Thus did Sharp, conscious of the advantage of the extraction of the cataractous lens from the eye, and appreciating the value of the essential principles of Daviel's method, give to the world with the utmost candor and humility the facts and results of his experience in a new field of surgery. He had established a great improvement on the benificent "discovery" of Daviel. Through the *Philosophical Transactions* and his "Critical Enquiry" it was promulgated to the English speaking world, and through Morand it was made known to France. The greatest interest pervaded professional circles both in England and on the continent, and im-

mediately did the strife begin to invent a knife of best form and size with which to incise the cornea, and to take the place of Daviel's "needles" and scissors. After Sharp and de la Faye's knives, came those of Poyet (1753), la Haye (1755), Bérenger (1756), Tenon (1757) and Pamard (1759), in France, and of Warner (1754) in England, and Thomas Young (1756) in Scotland. Heated discussions arose regarding the comparative value of the different methods of extraction and of the instruments used, and also over the question as to whether couching or extraction yielded the best results. The controversy regarding instrumentation is not closed yet. But the operation of extraction long ago took the supremacy, and in its simplest form it had its beginning with Samuel Sharp, the London surgeon. In the capacity of originator he stands but little below the immortal Daviel himself. With an insight, genius and skill seldom if ever surpassed, he took Daviel's gift, and without other guide or compass, brought the operation of extraction, even in the face of inherent obstacles and difficulties, to a perfection which challenges the most profound admiration. He used the single knife, the form of which was such as might be successfully used to-day, his corneal incision was in accordance with the best notions of the most skillful operators of the present time, except that it was downward instead of upward; he did not excise a portion of the iris, and he endeavored to remove the lens in its capsule, a desideratum still desired by many. He foresaw the needs of the operation, and hinted at improvements which have since been adopted. He was mistaken in a few things, but for the most part he was right. He proved himself a great leader, and, figuratively speaking, he took Daviel by the hand and championed a cause which secured one of the greatest triumphs of modern surgery.

Such, then, is something of the life and work of one of England's greatest surgeons. In brief, he had great originality, clear insight, and his moral character was unimpeachable. His writings were characterized by clearness, brevity and simplicity, a style which England lacked at that time. He was an enemy to the mania for authority, and was hostile to routine. His originality, independence and mechanical talent left their impress on all he said or did. There were

few surgical diseases on which he did not put forward new ideas, and in none did he effect such great advancement as in cataract and its treatment. Few, also, were the operations whose instruments or procedure he did not improve. Sir James Paget said: "He was a thoroughly informed surgeon, well-read, observant, judicious, a lover of simplicity, wisely doubtful. I think, too, he must have been an eminently safe man, who might be relied on for knowledge or doing whatever, in his time, could be known or done for the good of his patients. In this view, I believe he was as good a surgeon as Hunter" (Paget's Hunterian oration, 1877). D'Arcy Power (National Biography) says that while his works contain nothing that can justly be called pathology, or the principles of surgery, nor any sign of a really scientific method of study, yet they are replete with practice and practical procedures. With Cheselden as his master, Warner as his immediate pupil, and Hunter as his "pupil by tradition," Sharp becomes interesting as the connecting link between the old and modern surgery.

Very justly is Sharp thus highly esteemed as a surgeon. But none the less justly may ophthalmologists claim him as one of their most learned and progressive pioneers, and as one of the most brilliant ornaments to ophthalmic surgery. It is fitting, therefore, that his life and work be recalled and a registry made of them in the present-day annals of ophthalmology.

NOTICE.

At the meeting of the American Academy of Ophthalmology and Oto-Laryngology held at Denver, Aug. 24th to 26th, 1904, the following officers were elected for ensuing year:

President, DR. H. W. LOEB, St. Louis.

First Vice-President, DR. D. T. VAIL, Cincinnati.

Second Vice-President, DR. R. LEVY, Denver.

Third Vice-President, DR. E. SMITH, Detroit.

Secretary, DR. G. F. SUKER, Akron.

Treasurer, DR. O. J. STEIN.

Council: DR. H. W. Loeb; DR. E. Jackson, Denver; DR. W. L. Ballenger, Chicago; DR. C. A. Wood, Chicago, and DR. M. J. Ray, Louisville.

HEMORRHAGE FROM LACRIMAL DUCT FOLLOWING REMOVAL OF STYLE.*

BY J. C. BUCKWALTER, M.D.

ST. LOUIS, MO.

THE following history was given me by the patient:—
February, 1895, Mr. G. W. C., age 39, weight 210, suffered with a bad cold in the head at which time the right eye teared. After eight weeks of tearing the eye became ulcerated, the cornea mottled and vision very poor. The ulcer was treated six weeks by Dr. M., Chicago, with no perceptible benefit. Dr. B. was then consulted and treated the eye four months. Dr. B. probed the lacrimal duct and lessened the tearing for a time, but the treatment did not improve the corneal lesion.

Several months elapsed without treatment until Dr. F. was consulted in February, 1896. By the application of a Spanish fly blister Dr. F. gave almost immediate relief to the eye, and in seven weeks the eye was well. No treatment had been directed to the tear duct, and it was worse.

In July, 1897, Dr. H. was consulted in regard to the increasing epiphora. The treatment instituted consisted of probing and syringing. After persisting in this mode of treatment some time there was no noticeable improvement in the tearing. At this juncture there appeared for the first time a slight swelling at the inner corner of the right eye. By pressing the lacrimal sac a yellow secretion was forced out. At this time the lower canaliculus was slit, probing and syringing was continued at intervals for some time with very little improvement. Finally a silver style was introduced into the duct. This was removed and cleansed at intervals for some weeks, until the doctor left the city on a vacation for a month. During the doctor's absence the patient received no treatment.

After the lapse of one month the patient returned for treatment. The style was sought for but could not be located at first. Finally it was found imbedded in the duct far down. Several attempts were made for the removal from above downward, and considerable force was used during

*Read at the 9th meeting of The American Academy of Ophthalmology and Oto-Laryngology held at Denver, Aug. 24th to 26th, 1904

these attempts. The parts were lacerated and the œdema following the manipulations was marked for several days, causing the patient to keep close to his office. During the following three months the patient kept away from the doctor. On his return for treatment the weather was severe, so Dr. H. advised waiting.

Not until June, 1898—nearly a year after the first attempt—was a further effort made for its extraction. At this sitting fruitless attempts were made from above through the lacrimal duct, and from below through the nostril. Two months later another attempt was made, but to no avail. Dr. H. now advised to leave the style where it was; that it would cause no trouble.

The patient consulted physicians in various cities. Many tried to convince him that there was no style in the duct. Finally an X-ray examination was made and the operator located the style in the lacrimo-nasal duct. No attempt was made to remove it. Later a physician was again consulted and another X-ray examination made, but the examiner failed to locate the style. (The X-rays are like physicians—prone to disagree).

July, 1903—six years after the style had disappeared—Mr. G. W. C. consulted me and related the preceding account of his eye affection. Not until two months previous did the style cause any marked annoyance and discomfort, aside from the increasing epiphora, and accumulation of muco-purulent secretion which the patient was compelled to express from the lacrimal sac several times daily. About two months ago the patient first noticed a feeling of stuffiness and frequent occlusions of the right nostril; at the same time an unusual quantity of thick yellowish blood-stained secretion was deposited on the handkerchief at each expulsion.

On inspecting the right nostril I found the mucoso of the inferior turbinate bone congested, particularly the anterior portion, which impinged upon the septum. After thoroughly depleting the mucous membrane with the active vascular constrictors, cocaine and supra-renal extract, the turgescence readily subsided. The floor of the nostril and inferior meatus was filled with mucoid secretion which was removed with a nasal douche. The style could now readily be felt with a

probe. It was firmly fixed and the end rested on the floor of the inferior meatus. The lacrimal duct seemed stenosed, it being impossible to force fluid through it with a syringe or to pass a probe.

One week after the above examination, at twelve o'clock noon, an operation was made in the right nostril for the removal of the style. The nostril was sterilized as thoroughly as possible by means of an antiseptic douche. It was anaesthetized by packing with pledgets of cotton saturated with a four per cent. cocaine solution, which remained in the nostril about ten minutes. (I have on several occasions noticed when cocaine solution is left in contact with a mucous membrane over fifteen minutes, hæmorrhage during an operation is usually free). After removing the pledgets of cotton the inferior turbinate body was swabbed five or six times with supra-renal extract solution. With a Holmes inferior turbinate saw, the anterior portion of the inferior turbinate bone was sawed through, and the isthmus of tissue cut with a Beckmann scissors. Some bleeding accompanied the operation. On delivering the severed piece of tissue with an angular forceps, the nostril was cleansed with a saline solution and the style, which had been loosened when sawing through the turbinate, came away imbedded in a blood clot.

Following the delivery of the style the hæmorrhage was quite free, more than is usual after so slight an operation. The nostril was snugly packed with strip gauze and the bleeding lessened. The patient being anxious to go to his office, was dismissed with instructions to use an ice cold compress to the bridge of the nose, the side of the face and back of the neck, to lie down and keep quiet and to take five drops of adrenalin solution every twenty minutes in case of bleeding. For pain or hæmorrhage, I also ordered one-half grain of codeine every hour.

About three-quarters of an hour after leaving my office the patient returned with sufficient evidence that his nose had been bleeding, and was now bleeding freely. He had used the ice compresses as directed, adrenaline internally and a dose of codeine, to no avail.

I immediately withdrew the gauze packing from the nostril, sprayed it with supra-renal solution, douched with

ice cold water and with hydrogen peroxide of full strength, bade the patient lie quietly, placed ice cold compresses to the nose, face and nape of neck, administered by mouth twelve grains of supra-renal extract every hour, two drops of veratrum viride every ten minutes (the pulse was full and strong, 75 beats per minute) hypodermically, one-half grain morphine and one one hundred and fifties atropine ever hour. In spite of these measures the bleeding continued unabated until 4 P. M. At this time I took the patient home in a carriage. We reached his home in thirty-five minutes. In transit the amount of hæmorrhage did not measure more than three ounces, and when we reached our destination the bleeding stopped, to my great relief.

Dr. J. A. James saw the case during the active bleeding. Dr. M. A. Goldstein saw him at his home when the crisis had passed.

I saved as much of the blood as possible in order to know how much was lost. There were four pans full, holding altogether four and one-half quarts, not to mention that which was caught by towels and deposited in the cuspidor.

Three weeks after removing the style dilation of the lacrimal duct was commenced, and after three months treatment a number six Bowman probe could be passed. The epiphora had nearly disappeared when the patient was last seen, about four months ago.

While the arterial and venous supply to this particular part of the lacrimal duct region is plentiful, there is a conspicuous absence of vessels of importance. There is a profusion of veins surrounding the lower portion, and a dense venus plexus extending throughout the nasal duct. Notice will be taken that on the style there is a deposit. This foreign substance possibly eroded the capillaries, thereby weakening their contractile power, or by lacerating the small vessels laterally—not clearly dividing them—prevented their contraction. The inflamed condition eventually produced in the surrounding tissue by this foreign body demonstrates that a foreign substance is prone to manifest sooner or later that it is alien to such surroundings.

ABSTRACTS FROM MEDICAL LITERATURE.

By W. A. SHOEMAKER, M.D.

ST. LOUIS, MO.

MALPOSITION OF THE HEAD (TORTICOLLIS, CANTED OR TILTED HEAD) WITH RESULTANT ILL-HEALTH, SPINAL CURVATURE, ETC., DUE TO EYE-STRAIN.

George M. Gould (*American Medicine*, May 21) states, that having noticed for years that many patients, during the practical tests of refraction, habitually held the head in an abnormal position, he was led to closely observe and study the cases, with the result that the cause and mechanism of habitual malposition of the head during refraction has now become so clear to him, that before establishing the accurate diagnosis of astigmatism he is able to foretell with considerable accuracy what will be the axis of the dominant eye. To do this the patient must sit with body erect, head upright, accurately facing the test letters, the refractionist himself being in a position that he will observe with ease and quickness any abnormal position of the head of the patient. If the patient's head persistently remains in, or returns to, an abnormal position, and he be right-handed and right-eyed, the peculiar axis of astigmatism causing the malposition of the head is probably in the right eye. If the patient be left-handed and left-eyed the ametropic defect is likely to be in the left eye.

Astigmatism that can produce head-canting must be from 8° to 25° —usually from 10° to 18° —to either side of axes 90° or 180° . If the tilt of the head be dextrad the axis of astigmatism of the dominant eye is in the neighborhood of 75° if hyperopic, and 165° if myopic. If the tilt of the head be sinistrad, the axis of the dominant eye will be usually 105° , rarely 15° . If the head be thrown directly backward or forward, in a stiff and constrained position, it is probably due to hyperphoria and to the effort to bring the two visual axes to a horizontal.

All orthopedic surgeons know that persistent malposition of the head, especially in the young, will cause secondary spinal curvature. The number of patients with these canted heads is astonishing. The number of those with secondary and unsuspected abnormally curved spines is not less remarkable. Out of twenty cases of canted heads, he found a number of cases of spinal abnormalism, altogether unsuspected by their parents and physicians.

To gather the data, and to wait for cures, by glasses alone, requires time. He gives this preliminary note in order to place the method in a general way before oculists and orthopedists. Six illustrative cases are epitomized, which will be more fully described in the future.

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ORIGINAL ARTICLES.

EDUCATION FOR OPHTHALMIC PRACTICE.*

ADDRESS OF THE PRESIDENT.

BY EDWARD JACKSON, M.D.

DENVER.

WHEN forty years ago a few men met in New York to form the American Ophthalmological Society, the oldest of the American special societies, there were probably not two score physicians in America who "devoted themselves chiefly to the practice of diseases affecting the eye, ear, nose or throat." To-day there are more than two thousand within the borders of our country who are for that reason eligible to membership in this Academy, and who need a connection with such an organization. The specialist requires a special literature, he requires special societies, and primarily he requires a special education. So long as special training was needed by only a few scattered individuals, the means by which it might be obtained were of importance only to those individuals. But now that this special training is required by a large and rapidly increasing body of physicians, the institutions that furnish medical education must take upon themselves the task of meeting the demands of the time.

Among the most important problems regarding medical education that will demand early solution are those that cluster around specialization in practice. If, in the future,

* Read at the 9th meeting of the American Academy of Ophthalmology and Oto-Laryngology held at Denver, Aug. 24th to 26th, 1904.

our profession is to be a group of closely associated specialists, the institutions which train men and women for its work must train them for special practice. As the most definite and most developed specialty that has grown up within the medical profession, ophthalmology probably shows in the clearest light yet obtainable, the needs and difficulties of such training, and on this account the discussion of education for ophthalmic practice has a broad general interest.

The advances in medical education during the past generation have all been in the direction of increasing its amount, either by lengthening the course of study, by raising the standard of requirements for admission to the medical schools, or by rendering the effort expended in medical instruction more effective by improved methods, such as laboratory demonstrations, and ward classes. But the accumulation of new facts, the opening up of new fields of scientific investigation, the increase of resources, applicable to the relief of human suffering, goes on with ever increasing rapidity. The new facts of value and importance in their medical applications, that each year brings to light within the broad domain of science, are beyond the power of any one human mind to master in a year's study. Specialization is then inevitable. Shall it be the specialization of disintegration or the specialization of organic development? Shall the medical profession be replaced by unrelated groups of narrow workers, ignorant of what is being done by the workers of other groups, having little contact with each other, and no broad scientific interest even in the problems which center around their own special work? Or shall we still have a great medical profession, its members capable of thinking beyond the daily routine, interested to trace relations in all fields of science, trained for full co-operation with all whose work it is to relieve suffering and conserve life? Which shall it be? The question must be answered by the medical education of the near future.

It was a misfortune that dentistry developed so much outside of the recognized lines of the medical profession. Perhaps it is our greatest debt to Helmholtz, and Graefe, and Donders, that ophthalmology grew up within those lines. In spite of the work of these great men and that of their

students, there are influences at work that tend toward the loosening of the bands which hold us in the medical profession. Most potent and dangerous among the influences are the failure of the medical school to give the specific technical training required for ophthalmic practice, and its failure to utilize certain branches of ophthalmology in the training of all medical students.

The training for a certain line of work must be judged first by the efficiency it confers for that particular work. Breadth of training, information and thought upon collateral lines are excellent, they are highly desirable, they are the things that I would argue for; but in preparing for a certain line of life work, the essential is training in that special work. Is there not something grotesque in the claim that the fitting of glasses should be done only by the medical profession, if the average graduate in medicine is sent out ignorant of the methods of measuring refraction, or with only the most superficial and perfunctory knowledge of the subject?

Remembering that a specialty exists because of what is special or peculiar to it, what is the special work constituting ophthalmic practice for which the practical ophthalmologist is to be trained? First, it deals with mathematical problems of refraction and ocular movements. Second, it includes particularly delicate and exact manipulations and operations. Third, it takes up the problems connected with a very special anatomy, physiology, pathology, therapeutics and hygiene. From these it extends so far as the individual practitioner may choose to go into the usual domain of general medicine and surgery.

It must be remembered that the correction of errors of refraction is something absolutely different from the usual measures of medical and surgical therapeutics. Success in this department depends not upon fortunate guessing, or the recollection of similar cases encountered in a wide experience; it depends upon a minute painstaking accuracy to furnish the data, from which a proper appreciation of physiologic relations can build the best formula for lenses. What has there been in the medical training of the past, what is there in the medical curriculum of to-day to train the student to

painstaking accuracy in mathematical measurements? Until he is so trained he is unfitted for the common, every-day work of ophthalmic practice. Not merely unfitted for dealing with rare conditions, the difficult cases, but unfitted to treat the first case that is likely to enter his office. Training in mathematics and mathematical measurements is the first step toward fitting the student for modern ophthalmic practice.

Next consider the need for education of hand and eye for the delicate manipulations properly expected of the ophthalmic surgeon. What is there in the usual medical course to cultivate the student's ability in this direction? True, he can spend time in a specially minute and delicate dissection. But how many medical schools require it? How much account will be taken of it in his final examinations? A medical course that merely permits the student to do this kind of work, is but one remove from a course that would permit him to gain all his medical knowledge and skill outside its requirements. There is nothing taught in medical colleges that cannot be studied outside. The plea that the medical course does not prevent the student from getting for himself the training required for ophthalmic practice, is practically an abandonment of ophthalmology to outside opportunities and outside instruction. But the present status of the medical course in this respect is not quite so innocent as this plea would make it. As a matter of fact the course is crowded with other things. The student's time and energy are so engaged by it that it renders other than its required training largely impossible. Then, too, the accurate eye and the delicate touch are things that must be acquired early in life. Year by year special excellence in these directions becomes less and less possible.

But perhaps the most glaring defect of the present medical course as a means of furnishing education for ophthalmic practice, is the lack of work in special anatomy and physiology. Anatomy and physiology are the foundations of scientific medicine. But the anatomy and physiology that have this relation to ophthalmic practice are the anatomy and physiology of the eye and related organs. It is of just as much importance for the ophthalmologist to have the train-

ing in this special anatomy and physiology early in his medical course, as it is for the general surgeon to be familiar with the anatomy of the bones and the joints before he takes up the study of fractures and dislocations. True, again, if the medical curriculum fails to occupy his whole time and so crowd the student that work outside of its lines will be impossible, he may take up this study of ocular anatomy and physiology as a sort of voluntary outside pursuit. But from those who attempt to determine his fitness for practice, he will not receive the same credit for knowing the depth of the anterior chamber where he is to make the cataract incision, as he would for remembering the location of the vermiform appendix or the anatomy of the ankle joint, for which knowledge he will in ophthalmic practice have no use whatever.

If you have followed my line of thought you have already noted that it gives a direct challenge to the old orthodox view of the training of a specialist, viz.: Teach the student how to cut off a leg, prescribe a compatible mixture, or manage successfully a case of labor—and leave him in ignorance of that vast accumulation of knowledge, and unskilled in those extremely delicate manipulations and precise methods, upon the accuracy of which his ability to serve the community as an ophthalmologist will chiefly depend. The plan of carrying a student through his college course in entire disregard of the line of work that he is to take up afterward, lacks any sound basis in psychology, and it is condemned by its results. Graefe entered upon the study of medicine that he might become an ophthalmic surgeon. All the knowledge and experience, all the manipulative and diagnostic skill that he gathered were arranged with reference to this purpose. From the first, each item took place and relations from its bearing upon ophthalmic practice. If I read his career aright, it was this fact far more than peculiar natural abilities and good opportunities, that made him the pre-eminent, practical ophthalmic surgeon among the founders of modern ophthalmology.

The hands, brain, intellect, of the individual develop but once; they reach the highest efficiency only when that development is continuous and intelligently directed from the start. All unrelated information is an incubus; every

accomplishment that brings no added ability by change of activity or broadened view, is a dissipation; and the spending of a large part of the four years of a medical course in loading up with useless detail of fact, and the acquiring of highly specialized ability to do what will never be done, is a criminal waste of vital energy when every bit of vital energy is needed. Either the medical course must be reorganized to give what the developing specialist needs, or the specialist will cease to take it. Let me protest that this is not a plea for a narrow specialism. It is the advocacy of a real specialism, so stripped of what is useless and hindering as to render possible the attainment of the broadest development of which the human mind is capable.

The work of readjusting the general scheme of medical education to the essential fact of specialism, must be one of revision, selection and rearrangement, not simply a matter of addition. The plan of raising the standard of medical education by adding now and again a year to the length of the course, has gone to the limit. We know how many years the average healthy individual can expect to spend in active life; we know how many years intelligence, nerve centers and muscles remain plastic, and best fitted to acquire new thoughts, co-ordinations and movements; we know at what age the best results in character demand that the young being should be thrown upon his own responsibility, left free to make his own choice and to self-support. These periods will not be greatly altered in a thousand years, however great the rush of discovery and the broadening of the field of human endeavor. The readjustment of the medical course cannot be a matter of infinite extension; it is a matter of wise selection.

From the standpoint of ophthalmic practice in the opening years of the twentieth century, what are the selections that will give the student, for the time and effort he expends, the highest efficiency in his chosen line of work? What will give this with the smallest amount of unprofitable acquirement, that he may be left with time, energy and intellectual appetite to follow to the furthest limit every line of thought that seems to him naturally related to his work? Yet which will give him the breadth of interest and sympathy, the all-

around mental development, which will fit him to see his work in its broadest relations?

In the end, a curriculum will be settled by experience, and is likely always to remain full of tradition and compromise. But it is worth while to guide ourselves, in these gropings toward something better, by the clearest statement we can frame of what seems at this time an ideal to be aimed at. Of the studies that now form the frame-work of the medical course, none can be wholly dispensed with. Possibly obstetrics in its narrower limitations might be cut out altogether; but certainly the outline of intra-uterine development, and some knowledge of the general conditions that mark pregnancy and the puerperal state, must be retained. The process of selection is not so simple as the selection of certain branches. It must go into every part of every branch of medical teaching, weigh the individual facts, and even choose the point of view and avenues for their approach.

In anatomy, the point of view has been too much that of the general surgeon. The specialist of internal medicine has suffered from this as much as the ophthalmologist. As the general surgeon would resent being required to learn and remember that minute anatomy of the retinal vessels which is needed for the understanding of a case of partial retinal embolism, so the ophthalmic surgeon has a right to protest against having his memory burdened with the land-marks by which the iliac artery might be located for ligature, or the position of the sciatic nerve determined for the injection of a local anæsthetic. If it is impractical to drill the general surgeon in all the minute anatomy that the ophthalmologist should know, it is equally impracticable to begin the preparation for ophthalmic practice by loading up with the anatomical equipment of a general surgeon.

The anatomy which the ophthalmic surgeon should know must include that of the eyeball and its appendages, the orbit and neighboring cavities, the visual tract and whatever intersects or comes in relation with it. These he must know with greatest accuracy and in minute detail. But to this knowledge must be added such a general acquaintance with the anatomy of other portions of the body as would enable him to understand the physiology and pathology of the

different organs and to appreciate any general principle of anatomical construction and support. Thus an acquaintance with the hip and shoulder joints will give a broader appreciation of the principles of the ball and socket movement which takes place in the case of the eyeball. While such things as the anatomical and surgical necks, the great trochanter, or the greater tuberosity of the humerus, have little more bearing on general anatomical principles than they have upon ophthalmic operations.

Physiology is so closely connected with general pathology—faults of nutrition in any part of the body are so often related to diseases in the eyes that its general principles should be as thoroughly taught to all who practice ophthalmology as to those who practice any branch of the healing art. Still there is much of detail, of surmise, of experiment not yet sufficiently connected with normal life processes, to make it possible to exclude a great deal that finds place in the physiological text-books, when it comes to selecting that which he can properly be expected to remember. The nervous, muscular and vascular systems are so extensively represented in the eye, and play such important parts in its normal and physiological life that nothing related to their general physiology should be neglected. Then there is the large mass of special physiology, such as ocular movements and the optical properties and actions of the eye, which must be mastered and assimilated before the education of the ophthalmologist can profitably go on to other branches. Shorn of all that can be dispensed with, physiology has for the ophthalmologist, as for the physician or general surgeon, an overshadowing importance.

General pathology—the physiology of disease—is of similar importance. Nearly all the general morbid processes are represented in the diseases of the eye. There is as much need for the familiarity with them here as in any branch of medical practice. Indeed so much more certain and definite is the pathology of the eye in some respects, as in renal retinitis, that more exact and definite knowledge of the changes he has to deal with, can properly be expected of the ophthalmologist than of the specialist of internal medicine, or of the general surgeon, who may be compelled to use his scalpel as an instrument of diagnosis.

The things that can be excluded from the training required in pathology will be chiefly the descriptions and examinations of special appearances presented in distant organs, and the special pathology of organs not closely related to the eye. As to the vast science of bacteriology, it is still uncertain to what extent such recently acquired knowledge can be rendered available for the instruction of the student. But that this subject touches ophthalmology as closely as any other branch of medicine, has already been proven; and a general acquaintance with it will certainly be more directly applicable to practice, and do more to broaden the student's intellectual horizon, than will instruction in many of the details which have in former years been given an important place in the medical curriculum.

The teaching of therapeutics offers some of the most difficult problems that are to be encountered in connection with the subject of medical education. On the one hand the physician has been swamped by the energy, cupidity, plausibility, and falsehoods of the promoter of new drugs. On the other hand, therapeutics is preeminently the study for a life time. If there be general principles discernable in this branch of medical science, they are of highest importance to the ophthalmologist. If there be exact and comprehensive knowledge of the action of any drug upon tissues represented in the eye or its appendages, as all the general tissues are, that knowledge should be completely at his command. The therapeutic influences aside from drugs, at our disposal, demand equal attention. The eye has a situation peculiarly favorable for their efficient employment.

The special therapeutics of ophthalmology have grown to large proportions. This is illustrated by the recent interesting, but fragmentary, work of Darier. To gain time for what is most worth knowing in the first year of ophthalmic practice, something can be gained by cutting out from the course the *materia medica* and pharmacy, which were of value to a former generation. But when all has been done in a general way, it will still remain for the conscientious teacher of therapeutics to exclude a great deal that almost every other doctor might think his student ought to be taught. Nothing short of this will bring the subject into such com-

pass that the average student mind will be able to find it more than a mass of unrelated facts and contradictory assertions.

When we come to general medicine and surgery, as they have been understood and taught in the past, we come to the problem of teaching in cognate specialties. For these are little more than parent groups of yet imperfectly defined specialties, from which the more definite specialties, like dermatology and laryngology, are from time to time dropping off. The general principles which formerly justified the titles, "principles of medicine" and "principles of surgery," become more and more scattered to the general branches of physiology, pathology and therapeutics, although they might still be considered together in a philosophy of medicine. In every department of general medicine and surgery, and in every other specialty, there are facts and generalizations of the highest importance to the ophthalmologist, both for their particular significance and the added breadth of view they will confer. The general symptomatology and course of syphilis and tuberculosis has a most direct and important bearing on the recognition and treatment of certain diseases of the eye. A knowledge of toxæmias of intestinal origin may have extremely important bearings on our treatment of toxic amblyopias. But not all the information and deductions that can be brought together under general medicine or surgery are of equal value. The mass is so great that some must be left out. Selection is the crying need in every branch.

No one can pass in review the numberless and vital connections of ophthalmic practice with other branches of medicine and surgery, without being impressed with the necessity for general medical education for this line of practice. The tendency to undertake it without any general knowledge of medicine shows serious defects in the present medical curriculum. It should be understood that the custom of teaching medical students a fair amount of internal medicine and general surgery, and the sending them out to adopt what line of practice they please, and qualify themselves for it as best they can, is doubly disastrous. The doctor of medicine who sets up as an ophthalmologist may be as ignorant of the actual work he is to do, as the counter-prescribing optician,

who also founds his hopes of success on self-sufficiency. The public, gaining some inkling of this, estimates the two as approximately equally valuable councilors, and goes to the cheapest. The medical student who subsequently takes up general or family practice, brought up in the same ophthalmic ignorance as his fellow student who has undertaken to practice ophthalmology, is quite liable to send his patients to the aforesaid prescribing optician, with whose particular brand of ignorance he is less conversant, and who is more likely to offer pecuniary favors in return.

The specialization of education, such as I have here urged, will do two things: it will furnish doctors of medicine really fitted for ophthalmic practice; and it will bind the medical profession together by bonds of mutual respect. It is not possible that special preparation for ophthalmic practice should remain dependent upon individual initiative. It is not desirable that it should be left to brief post-graduate courses, or to the so-called ophthalmic colleges. There is a great and pressing need that stable, conservative institutions of learning of the highest type should offer a formal course fitting their graduates for ophthalmic practice. When this is done it will be found to consist of certain special instruction added to a revised curriculum provided for all students of medicine. And medical education in general will have taken a long step forward.

DISCUSSION ON DRS. SUKER'S AND BUCKWALTER'S PAPER.

MELVILLE BLACK (Denver): Dr. Buckwalter's experience was so unique that it will be rather hard to find experiences parallel with it. It would seem to me, however, that this hæmorrhage would come under the nasal rather than a lacrimal hæmorrhage, inasmuch as the operation in the nose preceding the removal of the canula was responsible for the hæmorrhage. I have never had such an experience, but I have never tried to remove a lacrimal canula from the nose. I had one patient who had a lost lacrimal canula, and believing I could best serve her by extirpation of the lacrimal sac, I proceeded to do that, and removed the canula at the same time. This, in my opinion, is the best way to find these lost

canulas. I have had considerable experience with the use of canulas, and the more I have the more I dislike them.

As regards probing the lacrimal canal, I have always been favorable to the large probes. It has always seemed to me that if we are going to probe at all it is advisable to use a probe large enough to produce pressure. I cannot see any use in tickling the canal, and that is about all a small probe does. The longer I live, the more I think that probing does not effect a permanent cure, especially in cases that have reached the stage of purulent secretion. I used to think my cases got well, but I guess these cases went to some one else. The others came back later for more treatment, hence I am skeptical of these cases being cured by any form of treatment. In consequence, I lean more and more towards extirpation of the sac. It does away with the purulent secretion, the formation of pus, etc., and the patient is made comfortable and saved the trouble and pain of probing.

A. ALT (St. Louis): I agree with Dr. Black that this was a nasal bleeding and not a lacrimal bleeding. I thought of a similar case in my early ophthalmologic experience. The patient came to me with a lacrimal stricture. He told me that months before, while the doctor who treated him probed the canal, he had a sensation of something breaking, but he was told it was all right. I found considerable swelling in the lacrimal sac region, and on probing found the end of a silver probe that had remained in the lacrimal duct. I withdrew it with great difficulty, but no hemorrhage followed.

With regard to the large probes, I am of the opinion of Dr. Saker. I have never had a probe put into my nasal duct, but I have put some very small ones into patients' ducts, and if they do not cause pressure I do not know what pressure is. I have never been able to understand the experience of Theobald, who, experimenting on dry skulls, came to the idea that such large probes would be useful. I never use them myself. I also agree with Dr. Black that the more I use them the less I think of the value of probing, and I gave up the slitting of the canaliculus many years ago. If I cannot get in with a small probe at first, I use the dilator. The largest I have used for years is No. 6, and when there is pus, I make simply injections. I do not know if we accomplish

much by this, but the patients want something done, and I suppose I will also have to practice the extirpation of the sac.

B. E. FRYER (Kansas City): I agree with Dr. Suker in regard to the large probes. If we remember the pathological conditions, we will see that we only add to the trouble by the use of the large probes. We have more or less cicatricial tissue, and the large probe and the sudden stretching will set up an increased amount of scar tissue in and about the canal. I agree with Dr. Alt and Dr. Suker in regard to not slitting the canaliculus, but disagree with them that slitting it necessarily interferes with the capillary power of the punctum. I do not do it any more, but if properly done this need not be brought about. Using the knife and cutting the lid towards the globe of the eye, we can still keep up the contact of the lid opening with the eyeball, thus retaining the capillary action in draining.

A. H. ANDREWS (Chicago): I had a case which came to me with a lost canula, and I was able to locate it underneath the inferior turbinal. A little pressure on the lower end pushed it up where I could get at it without much trouble. The canula was filled from one end to the other with granulation tissue. It had not been draining for a considerable time.

With regard to the use of probes, I am inclined to think that the value of any probe, whether large or small (and I am disposed to use the small rather than the large), will be greatly increased by the use of an electric current in connection with the probing. Either the positive or negative, as indicated, has decided therapeutic properties, and I am unable to see any reason why these therapeutic properties are not to be employed in the use of the probe in opening and making permanently open the lacrimal canal. The little experience which I have had has been much more satisfactory to me than the use of the probe has been to the gentlemen who have been discussing this paper.

DUDLEY S. REYNOLDS (Louisville, Ky.): There are cases in which the slitting of the canaliculus and the introduction of probes are necessary. No one, I presume, would undertake the cure of a purulent infection of the sac without dividing the lower canaliculus to secure free entrance of the syringe and exit for the accumulated pus below. In cases where

no infection exists, I have reached the conclusion, as a matter of personal experience, that probing is undesirable and in most cases injurious, and where probing is often repeated it gets to be of almost daily necessity. The patient finally growing tired of this daily procedure seeks other counsel, and he goes from one to another, and you will occasionally see a patient after ten years still unrelieved. We rarely find one entirely recovered through the probing. Where there is no purulent infection it will often be found that narrowing of the puncta causes the stillicidium. I have lost confidence in the theory of the mal-position of the punctum. I have known cases where dilatation of the punctum as the only local treatment, repeated two or three times, resulted in recovery. In many cases small doses of iodide of potassium would be sufficient to bring about a cure, but not in cases that have been subjected to the treatment by the probe, either large or small. Other cases are relieved by the injection, with a syringe, of a drop or two of the solution of adrenalin 1-1000. A large number can be fairly traceable to obstruction in the nasal passages, and the removal of the inferior turbinal bone does away with the difficulty. As to those cases in which it seems necessary to use the canula, some of them do well and some do not. I have had three or four cases, all in recent years, where I have seen impaction; one case where I had introduced the canula years before came suddenly to me with great pain in the side of the face, swelling in the region of the lacrimal sac, obstruction in the nose, and stillicidium. A search of the sac failed to disclose the presence of the canula, and a careful probing beneath the inferior turbinate bone found it tucked down tight. I seized it with forceps and made gentle traction and it came away in two pieces. It had become eroded and broken. In such a case, the introduction of a probe becomes necessary to insure the thorough washing of the passages, which I prefer to do with the normal salt solution, containing one grain of bichloride of mercury to the pint.

J. A. DOXOVAN (Butte, Mont.): I believe most of these cases are reflex, probably due to conjunctivitis or some nasal trouble. A patient who was treated three months in Paris, consulted me on her return. I removed a small strip of the lower turbinate, after which she got well and remained so.

I disagree in the matter of probes. As was said, in most cases they are entirely unnecessary, but where necessary should be used. I can recall many cases treated previous to the last three years, and every one got well and remained so. I used them in one-fourth or more of my cases. I use the Theobald probe, and always pass the largest I am going to use the first time, using cocaine or general anæsthetic. I start with a low probe and use up to 12, 14 or 16 at first sitting. Where there is a history of having been treated by somebody for years, I use the probe until I feel a slight cracking in the bone. In about three days after this I pass a probe one or two sizes smaller, repeating a dozen to fifteen times when I consider the case well, and so far have had the good fortune to have them remain so.

DR. BUCKWALTER (closing discussion): In the case of hæmorrhage, it does not seem to me the bleeding came from the nose, from the fact that on inspection the bleeding seemed to ooze from the region of the nasal duct, and pressure with adrenaline over the severed part of the turbinate did not control the hæmorrhage a particle. In this case I could not feel the end of the style by passing a probe into the lacrimal duct. By probing in the nose it was felt firmly fixed. I removed only the anterior part of the turbinate; the area exposed was not great. In treating epiphora, I agree with Dr. Reynolds that a great many cases are due to pressure stenosis, a congestion of the part of the lacrimal duct known as the naso-lacrimal duct. I have treated several cases in which probing had been carried on from a few weeks to a year or more, and I reported three cases in which I operated on the inferior turbinate, removing a portion of it, and treating the inferior meatus. The idea is to relieve the congestion about the mouth of the tube. The lacrimal duct is a drainage duct, and it seems to me if you have inflammation of the sac, you have a stoppage of drainage, and you must re-establish drainage in order to keep up a constant flow of tears. By relieving the mouth of the sewer you relieve a great many of these cases.

DR. SUKER (closing discussion): I see that the consensus of opinion is about the same as I have expressed in regard to the use of large probes. Our effort should be directed

towards restoring, as nearly as possible, the normal condition in the canal. If you pass very large Theobald's or Bowman's probes you will not restore the natural condition. The canal is for drainage, and must not be robbed of its anatomical elements by undue probing. I have seen a number of cases where exceedingly large Theobald probes were passed, and they still complain of the trouble. The final treatment, and perhaps the only radical one at present, is the extirpation of the lacrimal sac, with the proper attention to any existing conjunctivitis.

SOME OBSERVATIONS ON THE PROGNOSIS AND TREATMENT OF HYPOPION ULCER OF THE CORNEA.*

By CHARLES J. KIPP, M.D.,

NEWARK, N. J.

IN a paper entitled "The Treatment of Serpiginous Ulcer of the Cornea," which I read at the meeting of the American Medical Association, Section of Ophthalmology, in 1902, and which is published in the *Journal of the American Medical Association*, August 2, 1902, I made the following statement:

"More than twenty years have now passed since I first observed that certain cases of serpiginous ulcer of the cornea, in which no further progress was noticed after they came into my hands, presented the features I am about to describe, and since then I have not seen a case in which they were present that did not heal under very simple treatment.

"From the margin of the ulcer straight or nearly straight lines, broadest at the ulcer and gradually tapering, diverge in all directions somewhat obliquely, through the parenchyma to the deepest layer. They never give off branches. The further end of these diverging lines are connected by grayish intermediate striae, of the same width throughout, and running at right angles to them. If present all around, these intermediate linear opacities form a complete ring of the same form as the margin of the ulcer, but situated more

* Read at the meeting of the American Ophthalmological Society, July, 1904.

deeply, and 3 or 4 mm. distant from it. Sometimes a smaller ring is seen between the outer ring and the margin of the ulcer. The cornea between the opaque linear opacities here described is cloudy, but that outside of the outer ring is usually of normal transparency. An ulcer situated in the central part of the cornea with these striae well developed, may be compared in appearance with a spider's web. In all of the cases of this kind seen by me the ulcer was at least five days old. I have never seen the picture develop in cases under treatment. The opaque lines gradually disappeared as the ulcer filled up. A few years ago, I made no microscopic examination of the exudation on the ulcer, but have done so recently, and while I have found the pneumococcus usually present in the progressive cases, I have been able to find but few in any of the cases presenting the above-described features. I think I am justified in assuming that the ulcer in these cases has ceased to be progressive and that any treatment which involves further destruction of tissue, or the danger of anterior synechiae is entirely unnecessary and should be dispensed with. I feel so sure of this that even in the cases in which blennorrhoea of the sac was present I have done nothing more in the way of surgical procedures than to split the canaliculus. In these cases the symptoms of the irido-cyclitis are usually not very severe, and the hypopion rarely fills more than the lower third of the anterior chamber. As I have already said, such cases always got well, and the only treatment required was warm fomentation with boric acid solution and instillations of a mydriatic. In all cases I was able to break up the posterior synechiae by a 1 or 2 per cent. solution of sulphate of atropin, repeated often during the first day and less frequently after that. In most cases I have tried to expedite the complete cicatrization of the ulcer by gentle massage with a salve containing a small quantity of the yellow oxide of mercury.

“The opaque striae here described and regarded by me as an evidence of the arrest of progress, were first described, as far as I know, by Saemisch in his famous chapter on the diseases of the cornea, and von Michel in his description of the serpiginous ulcer of the cornea corroborates what Saemisch has said about them. Both of these authors de-

scribe the linear opacities as of common occurrence in such ulcers, but neither of these writers look upon them as a sign that the ulcer has entered into the retrogressive stage. I have seen these linear opacities so often that it seems exceedingly strange to me that men of such large experience as Fuchs, Schirmer and Vossius have never seen the intermediary lines encircling the margin of the ulcer. I may mention here that I have been unable to find any reference to these linear opacities in the description of serpiginous ulcer in any American text-book. Whether or not the diverging opaque lines are due to folds in Descemet's membrane, as Schirmer seems to think, or are due to cell infiltration, as is held by Schmidt-Rimpler, I do not know; their similarity in appearance to the opaque lines diverging from the corneal wound sometimes seen after cataract extraction, can not be denied, but I have never seen in such cases the ends of the lines connected by the intermediary linear opacities. To me the diverging linear opacities have always seemed to extend obliquely to the inner layer of the cornea, although Schirmer says that they are all in the same place and in the deepest layer. I may say here, in passing, that I have seen precisely the same picture in cases of so-called abscess of the cornea, and in these cases also no further progress was noticed after the development of the linear opacities."

Since then I have seen many other cases presenting the features above described, and all of these too have healed without other treatment than the one above mentioned.

My object in referring to this matter once more, is to add to the above the result of a further study of the infected or hypopion ulcer of the cornea. During the last two years, I have observed that in the cases in which the straight diverging greyish lines radiate from *all* parts of the margin of the ulcer, if this was situated in the central part of the cornea, or from the margin nearest the center of the cornea, if the ulcer was situated near the periphery of the cornea, did as well under the simple treatment of warm fomentation of boric acid solution and instillations of a solution of atropin, as the ulcers in which the straight diverging linear opacities were connected by the greyish intermediate striae, described in my first paper. In cases in which the greyish linear opac-

ities were seen only on a part of the margin of the ulcer at the time the case came under observation, I have usually resorted to this same simple treatment for a day or two, and have often seen the striæ develop from the parts of the margin which was free from them when first seen, and further progress was arrested. In other cases of the same class, the ulcer continued to progress, and the margin of the ulcer from which no greyish striæ radiated because somewhat raised and of a yellowish color, and from here the ulceration advanced. The bacteriological examination in many of these cases failed to reveal the presence of pneumococci or other bacteria in the scrapings from the ulcer. With regard to the involvement of the iris and the ciliary body, these cases did not differ from those described in the first paper. As to the treatment of the cases in which the linear opacities above described were absent, my views may be found in the paper published in the *Journal of the American Medical Association*, of August 2, 1902.

EXTRACTION OF ANTERIOR CAPSULE IN CATARACT OPERATIONS—MORPHIA HYPODERMICALLY IN SIMPLE EXTRACTION.*

BY EUGENE SMITH, M.D.

DETROIT, MICH.

PRONE as we mostly are to the easy satisfaction on imperfect evidence and to rest in the experientia fallax, I desire only to lay before you the fruits of my own experience.

Regarding the extraction of the anterior capsule, let me refer to one or two of the anatomical features of the capsule. The anterior capsule is twice as thick as the posterior capsule. Most anatomists consider that the hyaloid membrane blends completely in front with the posterior capsule of the lens, which, in fact, represents it. There are other anatomists who think differently. If such were the case, i. e., if the hyaloid and posterior membranes were completely blended, would we be apt to extract the lens in its capsule without rupturing the hyaloid and getting an escape of vitreous? I think not.

*Read at the 9th meeting of The American Academy of Ophthalmology and Oto-Laryngology held at Denver, Aug. 24th to 26th, 1904.

Another fact: The anterior capsule is twice as thick at the anterior pole as at the equator. This point is evidenced by a bit of experience which has probably occurred to each of you, viz.: When we have wished to divide, with a needle, a secondary cataract that is somewhat thicker than usual, we have observed that the spot directly attacked with the needle did not tear, but a rent occurred in a portion of the capsule toward the periphery, and we failed to get a central opening.

The history of cataract operations and the very great diversity of practice in dealing with the capsule among different operators is abundant proof that the methods in common use are faulty in some respect. I wish to advocate the extraction of the anterior capsule as the best means of dealing with the capsule in any form of cataract extraction. It is not, perhaps, to be wondered at that more operators are not following this method, when we consider the amount of "cold water" thrown upon it by renowned teachers who hold up that "bête noire" dislocation of the lens, by pressure of the forceps in an attempt to seize the capsule. Dislocation is infinitely more apt to occur with the cystitome, and particularly if the capsule is thickened.

Knapp, some years since (1892), said: "There is a dark side to the secondary discission of the capsule—I mean the appearance of glaucoma." Others have noted the same, as well as the various forms of uveitis, etc.

It is a well known fact that seventy-five or more per cent. of the ordinary cystitome operations on the capsule require discissions later. Such is not the case where the capsule has been removed. In my experience less than three per cent. require subsequent discission: hence the fear of glaucoma and the other serious conditions occasionally following discission has been nearly removed from my practice.

I have not found a distinct opacity of the posterior capsule, except in cases where some degree of inflammatory reaction followed incomplete toilet. I have found rather a wrinkling, which I attribute to a lack of elasticity of the vitreous. The discission of this wrinkling I have ever found simple and seldom followed with inflammatory reaction.

Personal equation cuts but very little figure in the use of

the forceps. In 1891 (Sept. 6th number of the *Journal of the American Medical Association*) I published an article on "How to Deal with the Capsule," and gave to the profession a forceps which I had devised some time before, and which I have continued to use in all of my cataract operations since. In less than one per cent. of my cases have I failed to grasp and remove a large segment of the anterior capsule, and never have I dislocated a lens with the forceps. Many times I have removed the lens in its capsule, and never with loss of vitreous.

In a classic article by Landolt—"L'Opération de la Cataract de nos jours" (published in the *Archives Ophthalmologie* for 1892)—Landolt speaks favorably of my forceps and of having removed a lens in its thickened capsule without loss of vitreous. I have frequently, in cases of this character, gently loosened the lens from the suspensory ligament by a mild circular movement of the entire lens, after having grasped the capsule, before extraction.

I do not wish to convey the idea that I never have loss of vitreous in ordinary cases. I do, but no more so with the use of the forceps than in former years with the use of the cystitome. My particular reason for using the forceps has always been to escape the necessity for and danger of discission, and my experience in several hundreds of cases during the past thirteen or fourteen years has been all that one would wish for.

We have practically all experienced difficulties in the extraction of Morgagnian cataract where we have used the cystitome. A slight tear of the capsule permits the liquid cortex to escape, leaving the nucleus at the bottom of the wrinkled capsule, held as in a grasp; all endeavor to get it out increases the dangers. It has been my fortune to have had considerable experience in this class of cataract, and I had troubles of my own with the old cystitome and Greafe's knife, used to cut the capsule. Since, however, I have used the capsule forceps, I have never experienced any difficulty, the entire extraction being, usually, simple.

The forceps, as made for me by Luer, of Paris, contain four teeth on one blade and five on the other. The teeth are set on the under side of the drop, or curved portion of the blade, and only the points of the teeth made sharp. The

curve is located about 2 mm. from the ends of the blades, and is 1 mm. in extent. The curve is so gentle as not to interfere with the introduction of the forceps into the anterior chamber. The blades open automatically 5 mm. When the teeth are closed the blades are $1\frac{1}{2}$ mm. apart, which prevents catching or bruising the iris. As the teeth drop into the pupillary space when introduced, there is no necessity for tilting the blades and thus pressing the flap.

Morphine hypodermically in cataract extraction.—In *Knapp's Archives* for 1894, page 85, is published an article written by myself on this subject. For some reason I feel that it has not met with the frequency of use it merits. As a myotic it is, in length of action, far superior to eserine, and the liability to prolapse of the iris is lessened by its use.

We are all aware of the fact that for hours after a cataract operation patients suffer pain or discomfort, and the tranquility so desirable is many times wanting on this account. Then, too, the discomfort may cause unconscious efforts to keep the eyes still, which may also produce prolapse by contraction of the recti or pressure of the orbicularis muscles. A cough, too, which is generally considered objectionable, is easily kept within bounds by the morphine.

Until a few weeks ago I have never known morphia, hypodermically, to cause vomiting. I think in this case it was due to individual idiosyncrasy. I am pleased to state that the vomiting did not cause a prolapse, and the patient made a good recovery with a central pupil.

The sedative effect of the morphine and its strong myotic action fulfill very important desiderata in simple cataract extraction. I do not know whether the contraction of the pupil is due to the sedative action of the morphine upon the sympathetic nervous system, in consequence of which the capillary vessels of the iris become somewhat engorged and the pupil contracts strongly, or that a stimulation of the motor oculi centers causes the contraction. Suffice it to say, both a strong miosis and a sedative effect are produced. I give one-eighth of a grain immediately after the operation, and follow it once in three hours until four or five doses are given. Eserine is used, as usual, although I have, many times, depended entirely upon the morphine, not using the eserine at all.

CONCERNING THE SAFEST OPERATION FOR
SENILE CATARACT.*

H. GIFFORD, M.D.

OMAHA, NEB.

WHEN the title of this paper was sent to the Secretary, I was experimenting with a form of cataract operation, which I fondly hoped would prove the safest yet. Subsequent experience has blighted this hope, but I have nevertheless thought it worth while to give the Academy the results of my experimentation, together with such conclusions regarding the safest operation for cataract as I have been able to draw from nineteen years of an average practice.

Some twelve years ago DeWecker proposed drawing the loosened conjunctiva over the cornea by a purse-string suture in most cases of large accidental wounds of the cornea, and the method had such obvious advantages in the case of aseptic wounds that after using it for several accidental wounds it occurred to me to try it in cataract extractions, when the danger of secondary infection was unusually great; or where there was almost a certainty of loss of vitreous unless some extraordinary method of closing the wound were adopted. The purse-string suture, however, had the disadvantage of preventing any inspection of the anterior chamber and iris, beside reducing to a minimum the action of atropine drops; hence when I first put the idea into practice, in 1901, I used what may be called a half purse-string suture; the conjunctiva being dissected back from the upper half or two-thirds of the limbus only; the stitch however, starting below the cornea and passing clear around it. When a stitch of this sort is tightened the conjunctiva is drawn over the upper third or half of the cornea leaving a space below for the inspection of the iris. The first patient on whom this was tried was a man with a luxated traumatic cataract with T + 2. The stitch was put into position, the ordinary incision made, and immediately after the extraction was completed the thread was tightened drawing the conjunctiva down over the upper $\frac{1}{4}$ of the cornea. There was practically no reaction and the

*Read at the 9th meeting of the American Academy of Ophthalmology and Oto-Laryngology held at Denver, August 24th to 26th, 1904.

final result was excellent. In this case I made the mistake of injecting a cocaine solution under the conjunctiva. This made the flap so stiff that it could be drawn past the edge of the wound only with difficulty. In subsequent operations of the kind I used adrenalin freely and anæsthetized by touching the conjunctiva with swabs moistened with 20% cocaine.

I used the same method on four other cases of dislocated cataract, one case having the additional complication of a purulent dacryocystitis, incurable in the time at the patient's disposal. The results so far as the prevention of loss of vitreous and infection was concerned, were perfect in all these cases, and the question then presenting itself was: If this procedure gives such good results in complicated cases why not be logical, and give all cases the extra protection which it affords? I could see no good argument against the proposition and proceeded to use a slight modification of the method in five ordinary or only slightly dislocated cataracts.* By doing so I hoped to accomplish three most important things: 1st, the prevention of secondary infection; 2nd, the prevention of loss of vitreous in case of rupture of the zonular ligament, either before or at the time of the operation; 3rd, a prevention of iris prolapse by the additional support which the tense conjunctival flap gives to the corneal flap, thus allowing one to dispense altogether with an iridec-

* The modification consisted in using instead of the half-purse string suture a single simple suture passed from a point just outside the middle of the loosened conjunctival flap through the fixed conjunctiva at the outer margin of the cornea. This stitch being inserted and drawn to one side before the incision is made, when tightened, draws the conjunctiva over the upper half of the cornea with much greater ease than any other stitch that I have tried. It produces a pucker which can be excised with a snip of the scissors. This gives a result approximately like that obtained by the method of Kubnt, but is simpler.

I do not, however, give it my unqualified approval, because in one case in which I used it the eye was lost from purulent infection of the vitreous, the infection starting as nearly as I could tell at the stitch, and since this method brings the thread hole nearer to the angle of the wound than the purse string or half purse string suture it may be safer to use the former as has been recommended by Ellett, or a partial purse string which would leave only the lower third of the conjunctiva attached, and thus combine the advantage of allowing some view of the anterior chamber with an increased distance between the stitch and the angle of the corneal wound.

tomy, without the anxiety which has hitherto attended the simple operation.

The results in the first three cases were ideal. In spite of the fact that the new technique made the operation longer than usual, there was absolutely no reaction in the shape of pain or congestion of the iris and the visual results were above the average. The stitch caused absolutely no discomfort and came out or was taken out on about the sixth day, and the conjunctival flap gradually retracted to the edge of the cornea. In one of these eyes a preparatory iridectomy had already been performed, but in the other two a round pupil was left. Then followed in swift succession two infections. In the first there was a slight iris prolapse in spite of the tense conjunctival flap. To be sure the prolapse was entirely protected by the flap, and would of itself have caused no inconvenience nor danger, but with it there was a decided infection of the anterior chamber, with much pain, congestion and exudative iritis, subsiding under salicylate of sodium in the course of two weeks, and giving after a discission, vision = $\frac{20}{100}$.

The fifth patient was of an exceedingly tranquil disposition and although on the fourth day there seemed to me to be more congestion and discharge than was right, he complained of no pain, but on the next day it was evident that there was an infection. The stitch was removed, and the edges of the wound and the anterior vitreous were found to be purulent, and the case went on to partial necrosis of the cornea with mild panophthalmitis, and the eye was eviscerated. Thus having proved to my entire satisfaction that the large conjunctival flap is not a sure preventative either of secondary infection nor of iris-prolapse I decided that until some further perfections in the technique should make it safer I should reserve it for cases, in which, on account of a dislocated lens or some incurable infection, the dangers of the ordinary operation for cataract would be extraordinarily great. The fact that all of these large conjunctival flap operations including those of Kuhnt, C. H. Williams, Ellett and Czermak involve stitch holes through the membrane which we can never depend upon being aseptic may always prevent anything on this principle from coming into general use. In the operation of

Czermak it is true the stitch is placed at considerable distance from the wound, and might be dispensed with altogether, but it remains to be seen whether the difficulty of cleansing the sub-conjunctival pouch of soft lens matter and of dealing with iris prolapses, if they occur, will not limit the application of this operation also, to a comparatively narrow field. The operation of Czermak is, of course, a direct descendant of the operation of Desmarres as revived by Pansier, in which a large conjunctival flap is made, but not detached; but while this operation involves no stitching, the objections already urged against Czermak's operation may account for the cool reception which it apparently has received in its French home.

Dismissing, now for the present, the use of very large conjunctival flaps with one or more stitches as a routine measure, a brief discussion of the ordinary small conjunctival flap may not be out of place. It generally goes without question that if the operator believes in making his incision far enough out to permit such a flap to be made, it should be made as a safeguard against secondary infection. Personally, I have always had a great deal of faith in the efficacy of these flaps, and at one time, but a few years ago, I made the flap much larger than is commonly done, not only at the summit, but at the angles of the wound. I was enabled to do this by making subconjunctival injections of cocaine, as has also been recommended by Koller, producing a bleb along the whole extent of the proposed wound, but I became convinced that this was a bad practice, the artificial oedema of the flap apparently interfering with its ready co-aptation at the close of the operation. I have accordingly returned to the use of the small conjunctival flap, but even this has some slight disadvantages, the chief of these being that even when turned forward as far as possible such a flap makes it less easy to do clean iridectomy; and where a prolapse of vitreous occurs, it is a distinct hindrance to the closure of the wound. These objections, however, do not seem to me serious enough to warrant giving it up.

As to the iridectomy, we can all agree that if it were not for the danger of iris prolapse, extraction without an iridectomy would be the rule. But while doing the simple operation I averaged about twenty per cent. of prolapses, pos-

sibly because, in order to get a conjunctival flap, I made too peripheral an incision. While, therefore, I envy the results of those who get only three to five per cent. of prolapses, I have ceased trying to emulate them, and make an iridectomy in all cases of senile cataract.

With those who take a similar view, the only question then is whether to make the iridectomy at the time of the extraction or as a preliminary operation. This has been threshed over a good many times, but the point is so important that until some consensus is arrived at I believe it should be reviewed occasionally. The chief objections to the preliminary iridectomy are, first, that it involves opening the eye twice; to this it may be said that a simple uncomplicated iridectomy is so nearly entirely safe that the increased risk involved by it is almost negligible. Second, that it involves greater loss of time, and, if the patient lives at a distance, an appreciably greater expense. This cannot be denied, but if on other grounds it is decided that the divided operation is safer, it seems to me that if the physician is in doubt as to whether the increase in safety more than counterbalances the increase in expense, the patient is the one to decide which is the one he prefers. In favor of the preliminary iridectomy is the unquestionable fact that the slighter the traumatism at any given operation, the less the danger of infection. With the iridectomy out of the way, the final extraction can be done if the capsulotomy is made with a knife, with the introduction of only one instrument into the eye, with a minimum of traumatism, bleeding, pain and loss of time.*

Another point in favor of the preliminary iridectomy, which in my opinion has not received sufficient attention, is

*One great advantage of the simple operation over the combined extraction as commonly done, is its painlessness. The pain experienced on seizing and cutting the iris, no matter how much cocaine has been dropped in the conjunctival sac, unnerves many patients, and some operators; but if two or three per cent. cocaine be injected under the conjunctiva so as to make a bleb around the lower half of the cornea, the iris can in most cases, after about five minutes, be seized and cut without causing any pain. I formerly made this injection around the upper half of the cornea, thus accomplishing the same purpose even more quickly, but as before mentioned have given this up on account of its tendency to interfere with rapid co-aptation, or adhesion of the conjunctival flap.

the lessened danger of small prolapses. This point has been urged especially by Aubineau, and is a very important one. These slight prolapses are so common, when the iridectomy is done at the time of the extraction, that Hirschberg, in a discussion of the subject, remarked that prolapse was as common with the combined operation as with the simple one. This statement, while it may be literally accurate, is not entirely candid, because most of these prolapses are so well concealed that they cause no disturbance: but it happens every now and then that a small prolapse at one end of the wound is a most troublesome thing and occasionally leads to sympathetic ophthalmia, more often, perhaps, than the larger prolapses, which occur with the simple operation. When the iridectomy is done, however, the angles of the coloboma become attached at the periphery of the anterior chamber, so that when the extraction is made the iris very seldom prolapses. In fact, I have never seen any difficulty from this cause after the divided operation. In view of these considerations I cannot help feeling that if I had a cataract myself, I should want it operated with a preliminary iridectomy, and doubtless many of you remember the occasion at a meeting of the British Ophthalmological Society, when the question was asked if there was any one present who would not prefer this operation for his own eye, and no one responded.

The custom seems to be with those who believe in the preliminary iridectomy to recommend this to patients who have but one eye, but not otherwise. I have never been able to see why we should not give a person with two eyes as good a chance for the first eye as for the second, and I consequently recommend the divided operation to all patients. Making it clear where the patient has two good eyes, and the question of time and expense is of great moment, that while I should prefer the divided operation if it were my own eye, the difference in the risk between the divided and the combined operation is not great, and allowing him to make the choice: but where the patient has only one good eye, I urge the divided operation without qualification.

In doing the divided operation, however, one must avoid the temptation to suit the patient's convenience and purse by

making the extraction too soon after the iridectomy. There can be no rule about the length of time which should elapse between the two operations. Occasionally an eye is as ready a week after the iridectomy as it ever will be, but in some cases it is better to wait two months, and it is always imperative, in order to decrease the risk to the minimum, to put off the extraction until every sign of increased discharge and irritability has entirely disappeared.

PAMPHLETS RECEIVED.

“Ophthalmic Memoranda,” by G. E. de Schweinitz, M.D.

“On Intrasccleral Nerve Loops,” by Prof. Th. Axenfeld.

“Sequelæ of Ophthalmia Neonatorum,” by D. M. Campbell, M.D.

“Liponea of the External Rectus Muscle,” by C. A. Wood, M.D.

“The Technique of the Optical Iridectomy,” by Prof. Th. Axenfeld.

“The Roentgen Ray in Ophthalmic Practice,” by D. M. Campbell, M.D.

“Demonstration of Microscopical and Macroscopical Specimens,” by Prof. Th. Axenfeld.

“Report of Two Cases of Family Macular Degeneration of the Cornea,” by C. A. Veasey, M.D.

“The Conformation of the Face in Relation to the Development of the Eye,” by F. T. Lewis, M.D.

“Report of the Eye Department in the Medical School of the University of Pennsylvania,” by G. E. de Schweinitz, M.D.

“Brief Report of a Case of Spring Conjunctivitis Resembling Malignant Growth of the Corneal Limbus,” by C. A. Veasey, M.D.

Report on a Case of Congenital Exophthalmos Produced by Orbital Hæmorrhage, Followed by Metastatic Choroiditis,” by C. A. Veasey, M.D.

“Concerning Certain Cases of Asthenopia and Eye-strain which are Independent of Refractive Error and Muscular Unbalance,” by G. E. de Schweinitz, M.D.

MEDICAL SOCIETIES.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.*

A. STANFORD MORTON, F.R.C.S., Vice-President, in the Chair.

Thursday, October 29th, 1904.

BLOOD SUPPLY OF THE OPTIC DISC.

Mr. NETTLESHIP communicated Notes on the Bloodvessels of the Optic Disc in certain mammals (18 species), and a few marsupials (3 species); no monkeys were included. The eyeballs were sent to him by Mr. F. E. Beddard, F.R.S., from the *post-mortem* room of the Zoological Gardens. The observations were based on the microscopical examination of both transverse and longitudinal sections of the optic disc, and the contiguous parts of the optic nerve. It was found in many mammals that the retina was almost entirely supplied by arteries derived from the choroidal system—cilio-retinal vessels—that reach the retina by passing round the sclero-choroidal border of the disc. Ophthalmoscopically this arrangement often (as, for instance, in the carnivora) caused an appearance somewhat like that of a deep glaucomatous cupping, and such cupping had been stated by Lindsay Johnson to be present in these eyes. But no cupping was found in any of the eyes examined microscopically by the author of the present paper, nor was the assumption of cupping necessary in order to account for the appearance. Another interesting observation was that even when the cilio-retinal vessels carried virtually the whole retinal supply, the central artery was seldom, if ever, quite absent, though often reduced to a minute vessel entering the optic nerve close to the eye. In some species such a minute arteria centralis became much enlarged at the lamina cribrosa by tributaries from choroid or sclerotic, the short trunk thus formed breaking up almost immediately in the disc for distribution to the retina; and ophthalmoscopic examination of such an eye would naturally lead to the erroneous conclusion that the

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supply was from a large arteria centralis as in man. Various other points were alluded to. The paper was illustrated by microscopical drawings.

BACTERIOLOGY OF THE CONJUNCTIVA.

A paper on the Bacteriology of the Conjunctiva was read by Dr. W. B. INGLIS POLLOCK, in which he reviewed and analyzed 204 cases of conjunctivitis in which a bacteriological examination had been made. There were 145 cases of acute muco-purulent conjunctivitis, including the acute contagious conjunctivitis of Weeks. Of these, 108 were due to the Week's bacillus, 7 to Morax's bacillus, 1 to pneumococcus, 2 to gonococcus, and 6 to staphylococcus pyogenes aureus. There were 3 of mixed infection, and 18 gave indefinite or negative results. In 20 cases of subacute conjunctivitis (Morax), the diplobacilli were found 14 times, Week's bacillus once, and there were 5 indefinite or negative results. In 9 cases of purulent conjunctivitis 4 were due to the gonococcus, 3 to Week's, one to pneumococcus, and one mixed with bacillus subtilis. In 10 cases of ophthalmia neonatorum, gonococci were found eight times, pneumococcus once, and once the result was negative. One case of membranous conjunctivitis was due to staphylococcus pyogenes aureus. Several other cases completed the series. The general symptomatology of the forms associated with individual organisms was discussed, and cases related bringing out special points. The advantage of a bacteriological examination of the conjunctiva prior to operation was illustrated by some cases. Cases of phlyctenular conjunctivitis only showed staphylococcus pyogenes aureus or the xerosis bacillus, and these, and especially the latter, were innocuous in the conjunctiva of almost all cases. They were consequently reduced to the theory of an endogenous origin, and Bruns had shown that by infecting sterilized tubercle bacilli into the arterial system he could obtain nodules very like phlyctenule. It was not possible yet to adopt a pure bacteriological classification of conjunctivitis, but such was coming nearer. For ascertaining the presence of gonococci a bacteriological examination was essential, and it should be carried out in all cases of membranous conjunctivitis. The paper was illustrated by lantern

slides which had been prepared for a course of lectures given by Dr. Freeland Fergus.

DEMONSTRATION.

Mr. BISHOP HARMAN demonstrated a new ophthalmoscope; Mr. E. E. MADDOX showed some pigmy needles for suturing cataract wounds, and some delicate electric connections for use after cataract extraction.

PAMPHLETS RECEIVED.

“The Mastoid Antrum,” by S. Spencer, M.D.

“La Dacriaciŝtorinostomia,” etc., by A. Toti, M.D.

“Un Caso de Retinitis Circinada,” etc., by M. U. Francosa, M.D.

“The Physiological Treatment of Cough,” by F. C. Ewing, M.D.

“Memoir of Charles Henry Burnett, A.M., M.D.,” by F. R. Packard, M.D.

“Report of Two Cases of Cerebral Abscess, with Recovery,” by Ch. W. Richardson, M.D.

“Etiology and Pathology of Corneal Cysts, with Report of a Case,” by E. L. Oatman, M.D.

“Asthenopia and a Few Facts that Ought to be Generally Known About it,” by D. W. Stevenson, M.D.

“Simple Glaucoma in the Young, with a Report of Two Cases,” by C. A. Veasey, M.D., and E. A. Shumway, M.D.

“A Case of Foreign Body Remaining in the Lens of the Eye for Six Years with the Lens Otherwise Clear,” by F. W. Lewis, M.D.

“Two Cases of Paralysis of the External Recti Muscles of the Eyes, Tabetic in Origin, Improved by Operation,” by F. N. Lewis, M.D.

“Report of a Case of Chronic Purulent Otitis Media, with Thrombosis of the Lateral Sinus; Radical Operation, Excision of Internal Jugular Vein; Recovery,” by E. B. Dench, M.D.

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ORIGINAL ARTICLES.

SOME CASES OF UVEITIS DUE TO ACCESSORY SINUS DISEASE.

By H. M. FISH, M.D.
NEW ORLEANS, LA.

THE accessory sinuses communicate with the nose by small openings, those for the antrum, frontal sinus and anterior ethmoidal cells being situated in the middle meatus under the middle turbinate bone. A nasal inflammation or coryza, attendant upon any infectious disease, influenza, whooping cough, scarlet fever, etc., or an ordinary cold, may invade the sinuses direct or it may so congest the mucous membrane lining the canals or the adjacent parts, as to occlude the openings and shut off normal drainage or ventilation and so eventuate in a sinusitis. Nature may wholly relieve this condition, after a mucopurulent discharge of longer or shorter duration, there may be a complete *restitutio ad integrum*, or it may pass into the subacute or latent stage, when any additional cold or coryza from any cause would produce an acute attack or exacerbation. These acute attacks or exacerbations cause an increased secretion, pent up in the occluded bony cavity, the pressure on the delicate nerve endings causes the intense neuralgic pains localized at the cavity or often variously reflected about the head, on the same side, and they also cause passive orbital hyperæmia or engorgement (Ziem's theory, *Über Einschränkung des Gesichtsfeldes bei Erkrankungen der Nase und ihre Nebenhöhlen*,

Berl. Klin. Wochenschrift, 1888, No. 37, und Deutsche med. Wochenschrift, 1889, No. 5), as the vessels draining the mucous membrane lining the nasal and pneumatic cavities, the vasa supraorbitalia, frontalia, ethmoidalia, and ophthalmofacialia, drain principally into the vena ophthalmica. (Gurwitch, Über die Anastomosen zwischen den Gesicht's und Orbitalvenen, v. Graefe's Archiv, Vol. XXIX, No. 4.) This passive orbital hyperæmia could readily cause a venous stasis or an œdematous condition in the retina, chorioid, ciliary body, iris, etc., hence an iritis, papillitis, cyclitis, or in general terms a uveitis.

Case No. I.—Lady, 37 years old, first visit November 3rd, 1903. Patient complained of poor vision in the left eye, which she first noticed about six weeks previously. Up to that time her vision had always been good; she had never had any trouble on the part of her eyes and had never worn glasses. Status præsens R. E. normal, media, fundus, etc., with $+ .75 V. = \frac{10}{10}$; L. E. outward appearance normal, $V. = \frac{1}{10}$, pupil reacts, no posterior synechiæ or evidence of an iritis. Under homatropine, punctate keratitis, fine fixed opacities and delicate striæ in the vitreous, a white patch, a little larger than the papilla, was situated near the macula lutea above and external to it. Papilla hyperæmic and a general œdematous condition of the fundus. Several months before she had had the grippe and since then she suffered from occasional attacks of dizziness, photophobia, inability at times to use her eyes for near work, though there were intervals when close application caused no discomfort. She frequently had sharp, shooting pains in and about the eyes and in the orbital region, and a dull, heavy, nearly constant pain or full feeling in the forehead, aggravated by leaning forward, and which was regularly very marked at each menstrual period, though previous to the attack of the grippe, she had not suffered with headache at that time. This history is very suggestive of an inflammation of the frontal sinus; the attacks of photophobia and accommodative failure, due to a paretic sphincter iridis and ciliary muscle, with intervals of complete relief from these symptoms, the occasional vertigo and the pains in and about the eyes and the heavy feeling in the forehead, worse on leaning forward, and

with its regular aggravation at the menstrual period, all of which were sequelæ of the grippe, a frequent ætiological factor of sinusitis, all pointed to an acute inflammation of an accessory sinus, consequent to the grippe, which had developed into a subacute or latent condition with occasional exacerbations. Pressure on the lower wall of the frontal sinus, well back in the orbit, revealed marked tenderness. The middle turbinate was swollen, red and sensitive to the touch of the probe, even after cocainization. No discharge or history of a discharge. Diagnosis, uveitis due to frontal sinusitis. After cocainizing the middle meatus, the fronto-nasal canal was probed, rough or necrosed bone was felt with the tip of my probe. The next day a polyp was removed from the middle meatus. Patient was put on small doses of potassium iodide. In order to insure permanent drainage of the cavity, the anterior end of the middle turbinate was amputated and the sinus syringed a few times, obtaining a purulent discharge, and on the establishment of free drainage, the pains, feeling of pressure and fullness in the head, dizziness, etc., disappeared. There was no marked change in the vision; the patient said, however, she could see better. She returned to her home in the country and reported again in January. The cavity was still discharging; she said it soiled her handkerchiefs, and there had been no return of the old distressing symptoms. V. was $\frac{4}{10}$, no keratitis punctata or œdema of the fundus and the fine opacities in the vitreous were not so abundant. In April she reported a slight, almost continual discharge of whitish secretion from the left nostril, but now and then it had ceased when there had been a return of the frontal pains, asthenopia, etc., which disappeared immediately on the return of the discharge. The patient had noticed the coincidence—complete relief while there was a nasal discharge. Once the cessation occurred at the menstrual period when the frontal pains were severe, the only time she had suffered at that period since treatment of the frontal sinus.

Case No. II.—Man, age 23, came May 4th, 1904, complaining of dim vision in the left eye, first noticed three or four weeks previously. He had visited an eye, ear, nose and throat hospital where “drops” that dilated the pupil had

been instilled, medicine prescribed to be taken three times a day, probably potassium iodide, and he was told to return in two weeks. The patient lived in the country.

The left eye appeared normal in outward appearance, there being no marked ciliary or conjunctival injection. Punctate deposits on posterior layer of cornea; pupil fully dilated, no posterior synechiae; lens clear; fine striae and fixed opacities in the vitreous, papilla redder than normal, and a general edematous condition of the fundus. V. $\frac{1}{20}$, not improved by any lenses. No astigmatism. There was no redness or edema or pain in the surrounding parts. Right eye normal. No history of syphilis, rheumatism, or any severe illness. The fact that this was unilateral and there was no constitutional ailment would indicate that the trouble was purely local. About three weeks before he had had a severe cold, when he suffered with pain in his forehead. On being asked where the pain was located, he indicated the upper, inner orbital angle, left side, and said the pain had been deep down in the bone. Pressure well back on the superior orbital wall, under the frontal sinus, revealed some tenderness. Nasal examination showed a hyperæmic condition in the upper passages and the middle turbinate was swollen and soggy. No nasal secretion. Diagnosis: uveitis, probably due to frontal sinusitis. The middle meatus was cocaineized, the fronto-nasal canal entered first with a probe, then with a fine silver canula and some water injected into the sinus. The following day there was a serous secretion in the middle meatus. He was treated as before, but I did not see the patient for two or three days, as I was taken ill myself. He called at my residence and said he could see better with his left eye, but I took into consideration the fact that the effect of the atropine was passing away, and made due allowance for the patient's anxiety to see. As I was satisfied that the sinus had been reached and was discharging, the patient was allowed to go home with instructions to return at once if there was another acute attack. In about a week I sent for him and he came immediately. He reported that he could see a great deal better; said he could tell the time by his watch. His vision was $\frac{1}{2}$, under homatropine, with .38Ds, it was the same. There was no punctate keratitis, every

spot had disappeared; in the vitreous there were still a few minute opacities, but the delicate striae were almost entirely gone. The fundus was normal in appearance, with the exception of two minute white streaks or lines, one above the macula not close enough to effect central vision, but the other extended from near the papilla directly through the macular region.

The pathological condition in this patient's eye had existed three or four weeks previous to the time of his first visit. He had had his cold, a common cause of frontal sinusitis, and the accompanying pains six weeks, and he had noted the dimness of vision three weeks previously. I think that the result would have been a much better one had he received the treatment sooner; the formation of the white streak, affecting the central vision, might have been prevented.

This patient did not have the severe frontal pain, lasting for days, that generally accompanies sinusitis; but pronounced pain is not a *sine qua non* by any means. In several of my cases of sinusitis this symptom was not prominent and it was only obtained by questioning the patient. There may be nothing more than a heavy dull feeling in the forehead, and then some patients will not admit that there is any pain. Martin (Bull. et mémoires de la Société Française d'Ophtalmologie, 1894, p. 157) reported a case of lid œdema, chemosis, orbital abscess with displacement of the globe and V. reduced to ability to count fingers at one metre distance, due to frontal empyema. "Visual affections in cases of frontal sinusitis, but little studied as yet, are very rare, and are found only in the presence of an orbital tumor." (A review of the literature would have shown the error of the last statement.) The most noteworthy observation, however, that M. makes is the following: "A case of frontal sinusitis may exist without either local pain or appreciable muco-purulent (nasal) flow. In the absence of these two symptoms, considered constant by all classical authors, I was led to make an error in diagnosis, committed, however, by all the members of the society as well who had seen the case." (The patient had been presented to the society for diagnosis some time previously.)

The diagnosis of sinusitis in this case was determined by

the pain in the frontal region at the time of his cold, which preceeded the failure of vision, and the unilateral orbital as well as nasal hyperæmia, the former shown by the œdematous condition of the fundus, the reddened disc, indicating chorioid hyperæmia, and the cyclitis, evidenced by the punctate spots on the cornea; and ciliary involvement itself, ciliary paresis, is a very frequent and characteristic symptom of sinusitis. Moreover, the result obtained by the treatment is further evidence, and I think that that was due to draining the sinus, which removed the cause of the orbital hyperæmia, rather than to the few (to be exact, six) ounces of interna medication taken.

Case No. III.—Mr. C., age 51; first visit June 16th, 1904. Patient is a well preserved man with no history of constitutional trouble. Left eye, myopic and divergent since childhood: has but slight vision, moving hand noticed only in right field, but fingers not counted. Patient sees clouds and specks continually moving across the field, due to many floating opacities in the vitreous. Right eye, outwardly normal in appearance: cornea clear: pupil a trifle enlarged and contracting but little to light: few pigment spots on anterior capsule from an old iritis. No opacities in the lens or vitreous. The fundus showed a disseminated chorioiditis and retinitis with fine pigment deposits, no heapings, scattered here and there throughout the fundus, more abundant in the periphery, resembling a retinitis pigmentosa. Several minute stellate spots of pigment concealed the contracted retinal vessels, showing it to be retinal pigment. In the macular region there was a white patch the size of the papilla and several yellowish dirty spots. The chorioid vessels and the intervacular pigment spaces were very distinct throughout the fundus, in the macular region especially the vessels were nearly white and very plain against the pigmented background. Papilla pale. The field showed an absolute central scotoma and slight concentric contraction for white. Patient said that although the vision of the left eye had always been poor, still everything had been clear, there had been no shadows crossing before the eye, and the vision of the right eye had always been good until 1898, when he had a severe attack of the grippe, during which both eyes were very greatly inflamed,

“looked like raw beef,” and he suffered frightfully for several weeks with frontal pain. He was treated by an oculist who used packs, leeches, etc., and who told him the pain was caused by the inflamed condition of his eyes. Patient said that the pain in his forehead was that excruciating that he thought he would go mad. After the acute attack subsided, in addition to his poor vision, he still suffered with ocular and orbital pains which at times were very severe. He was treated by an oculist for a year without either visual improvement or relief from the frontal pain. Two years ago or more he consulted another oculist, and was also examined by a rhinologist about the same time, who made a negative report. Patient said the rhinologist told him that he did not find anything in his nose. Later on he tried the X-ray treatment, but without relief, and he now wants to know if anything can be done to help his vision and relieve him of the attacks of frontal neuralgia and continual feeling of fullness and pressure in his forehead.

As the above history was very suggestive of sinusitis, I examined his right nostril which appeared normal, save the middle turbinate which was engorged; on its external wall, towards the middle meatus, there was granulation tissue, and in the meatus itself granulation tissue and what appeared to be small polypi. On exploring the meatus with the probe there was a feeling of soft movable tissue which bled very easily. There was no nasal secretion. Diagnosis: Right eye, an old choroiditis, retinitis and iritis; left eye, an inflammatory process, similar to that in the right, and resulting in liquefaction of the vitreous, both probably due to an acute inflammation of an accessory sinus caused by the grippe in 1898, the subsequent pain and feeling of pressure and fullness in the head due to exacerbations of the latent sinusitis. I probed the right fronto-nasal canal. The next visit, four days later, the patient volunteered the information that on the right side he was relieved from the old feeling of pressure or fullness, there was no pain, there was a marked contrast between the the right and left side, “the feeling of embarrassment was relieved,” and that he had been blowing a white discharge from his right nostril. Examination showed a muco-purulent secretion coming from the right middle meatus,

from which I removed two small polypi, which, in this location, Grünwald (*Die Lehre von den Naseneiterungen*, p. 80, 1896, München) considers to be pathognomonic of an inflammation of an accessory sinus.

Patient was told not to expect any improvement in vision from treatment but that it might relieve him of his frontal neuralgia. The left frontal sinus was treated with the same result. The patient called but once or twice more, as I again told him not to expect any improvement in vision. On August 18, about two months after he received the treatment of the sinuses, he called and reported relief from the old neuralgic pains.

The following case, although it is but a typical one of severe irido-cyclitis, is unique, as I am satisfied after a thorough search of Nagel's Year Book of Ophthalmology that a similar case has never been published.

Case IV.—Mr. G., age 27, first visit June 9th, 1904. A week previous his left eye felt as though there was something in it and the following day it became red and pained him. Some local treatment had been used, but the eye became more inflamed. There was dimness of vision, photophobia, and the pain, both in the ball and bone over the eye, became much worse. History good. Examination: Slight oedema of both lids, lacrimation, severe episcleral injection, iris darker than the other and sluggish in reaction, no synechiae. Under homatropine, keratitis punctata on lower half of cornea; lens and vitreous clear, and no fundus changes noticeable, save a hyperemic papilla. Severe pain in and about the ball and in the frontal bone. Pressure under the lower sinus wall painful. The nasal examination showed the lower and middle turbinates hyperemic. No nasal secretion, past or present. Patient was myopic in each eye. V. with correction, R. eye $10/10$; L. eye $6/10$. Diagnosis: Irido-cyclitis; and although the nasal examination was practically negative and the severe trigeminal pains were but characteristic of an iritis, and although the case of iritis due to a frontal sinusitis published by Ziem (*Iritis bei Eiterung der Nase und ihrer Nebenhöhlen*, *Zentralblatt f. Augenheilkunde*, 1887, p. 358) was questioned by Kuhnt (see further on), still I looked upon an acute frontal sinusitis as the probable aetiology and treated the case accordingly.

I probed and syringed the fronto-nasal canal, which was more difficult than in the average case, owing to the unfavorable formation of the parts. No immediate discharge from the sinus was obtained, and during the following three or four days I treated the middle meatus and syringed the cavity once or twice again. The patient's condition, however, grew much worse; the constant frontal and temporal pain became excruciating and in addition there were sharp, shooting pains in the ear, teeth and various places in the head, on the same side. His sufferings prevented sleep entirely. Punctate keratitis more pronounced, the larger concrete spots being more abundant and a fine precipitate or haziness extending over nearly the entire cornea, with corresponding failure of vision. The patient remarked once or twice: "I don't see as well as I did yesterday." The vision was taken, but my notes were mislaid. Iritic adhesions appeared which yielded to a stronger solution of atropine. I then ordered K. I., packs and daily sweats, and considered more radical measures, as removal of the middle turbinate to facilitate drainage, or an external operation. But as the post-operative intra-nasal congestion sometimes temporarily aggravates the condition, and as the acute attacks of frontal sinusitis generally yield to syringing, I decided to wait a day or two longer, when a profuse muco-purulent secretion appeared in the left nostril, and with it immediate relief from the excruciating pains, which did not return. Auxiliary treatment discontinued. The eye rapidly improved, the œdema and conjunctival injection disappeared almost immediately; the ciliary injection persisted for several days longer.

Careful examination on the 20th failed to reveal any punctate spots on the cornea; only a fine haziness remaining in places, and vision improved to $10/10$, slowly. On the 24th, the fifteenth day after the first visit, the patient was dismissed. No haziness whatever of the cornea could be detected; there was but a trace of ciliary injection; the iris was the same color as the other, and vision equalled $12/10$, one letter missed. The patient was seen on the 27th. The ciliary injection had disappeared, and the eye presented a normal appearance.

Case No. V.—Young lady, age 18; first visit September

4th, 1903. Using $\pm .75$ D. s. for near work, prescribed six months before by an oculist. Suffers from asthenopia: cannot use her eyes for near work, and lately her distant vision had not been good. Marginal blepharitis and conjunctival injection, worse on left side. Under atropine she was hyperopic 1. D. in each eye, and weak convex lenses were ordered and, as they were not accepted, homatropine was instilled two different times: but she still refused to accept even a $\pm .38$ D. s. The latter part of October she complained for a few days of asthenopia, photophobia, etc. Pressure under and over the left frontal sinus painful; occasional epistaxis, especially when she had a cold. Patient had long suffered with attacks of neuralgia and asthenopia, very apt to be induced by a cold. Has often walked the floor at night on account of intense pain. These "headaches" of the patient were generally on the left side about the frontal region and occasionally there was pain in the ear, teeth and different parts supplied by the trigeminal. These attacks were often accompanied by epistaxis and œdema under the left lower lid. One attack of migraine was so severe she was confined to her bed for several days; the least jar, as she walked across the room, caused excruciating pain. She had been treated by a rhinologist for catarrh after removal of adenoids. Both turbinates left side engorged, the middle one especially so. I told the patient her eye symptoms and neuralgia were due to a latent or subacute sinusitis with exacerbations, but she would not undergo treatment.

From October to June she had several aggravations; in one her record shows asthenopia, epistaxis, pressure test very painful, dull frontal pain left side. Near point R. 20 cm., L. 35 cm., which taken at a later date was 12 cm. for each eye. On another visit, in addition to the above symptoms, she had, with a near point R. 10 cm., L. 22 cm., shooting pains in the left eyeball, anisocoria, the left pupil larger, sluggish and not contracting fully to light and accommodation, and œdema under the left lid. In March she suffered so severely that she finally consented to be treated; so the left frontal sinus was probed and syringed (March 18th). She did not return until six weeks later, on May 2nd. She had had no trouble since the treatment, and she had been

able to read and sew with comfort; but she had taken cold, which caused another attack. R. eye near point 13 cm., V. $^{10}_{10}$; L. eye near point 30 cm., V. $^{6}_{10}$, with $\pm .50$ D.s. $^{10}_{10}$, but "blurred." Asthenopia, sluggish pupil, etc. Treatment followed by relief.

July 6th, she called again, suffering with another severe attack: intense pain in and behind the eye, about the frontal bone, in the ear, teeth and face generally, on left side; pain so intense as to prevent sleep. Oedema under the lid, conjunctival injection, sluggish pupil with marked anisocoria to light and accommodation; near point 32 cm., V. $^{5}_{10}$, which was not improved by either plus or minus glasses. Patient said the vision of the left eye was very dim, "like a veil before my eye." I probed and syringed the left sinus. Following day much less pain, pupil nearly normal in reaction, though slight anisocoria still present to light and accommodation. Under homatropine, vision, no noticeable change, and no change in the fundus further than a hyperæmic papilla, could be detected. The sinus was treated on the following visit, and two or three days later every symptom had disappeared and her vision and punctum proximum were again normal. This was the worst attack she had ever had, as far as the visual acuity was concerned.

In this case, the marked loss of vision I consider was due to a hyperæmic condition of the fundus, which was not pronounced enough for me to detect with my ophthalmoscope, but which was evidenced by the reddened disc, the sign of choroidal hyperæmia. This slight oedemous condition of the fundus, engorgement of the ciliary (shown by the recession of the punctum proximum) and of the iris (anisocoria), the conjunctival injection and oedema of the lid were all caused by the frontal sinusitis, a beautiful demonstration of Ziem's theory of a passive orbital hyperaemia.

Case No. VI.—Lady, age 38, to whom I had given hyperopic glasses several months before, complained of occasional attacks of asthenopia, with pain and congestion, worse in the left eye, to which she had been subject for several years. One oculist attributed them to malaria, and a second to improper glasses, which, however, he did not change when the acute attack subsided. On March 3rd she reported that

two nights before she had suffered from an excruciating pain in the left eye and forehead, and since then the vision was poor in that eye. Examination: R. eye, normal; L. eye, conjunctival injection, cornea clear, pupil sluggish in reaction, no increase in tension noticeable; V. $\frac{1}{10}$, not improved by lenses; accommodation affected, as large print could not be read nearer than 50 cm. Ophthalmoscopic examination under homatropine: the most painstaking search with the suitable plus lenses failed to reveal any punctate keratitis or opacities in the vitreous. All media clear, giving a distinct view of the fundus, which was normal and showed the natural red color throughout, save a dark grayish slate-colored spot, about four papilla diameters in extent, oval in shape, and extending forward from near the macular region. The borders were not sharply outlined but faded away into the normal red color of the fundus. Crossing this dark mass, the retinal vessels were very distinct with a plus 4 lens, but the choroidal vessels, visible elsewhere, were concealed by it. No trace of hæmorrhage. As this was clearly a serous exudate lifting up the retina, it was not considered necessary to take the field in order to determine the diagnosis. Excursions normal. No œdema about the lids on either side. There was pain in the ball and in the bone over the left eye and tenderness to pressure over and under the frontal sinus. There was no nasal secretion, but the middle turbinate was swollen. Diagnosis: uveitis with subretinal exudate due to an inflammation of the frontal sinus, i. e., an exacerbation of a chronic condition. After anæsthetizing the middle meatus the fronto-nasal canal was probed. The following day, no change in symptoms, vision, pain, exudate, etc.; so after probing, a fine silver canula was inserted and some water injected into the sinus. The next day the patient reported complete relief from pain in the eye and orbital bones, and her V. = $\frac{1}{2}$, slowly. Considerable yellowish nasal discharge on left side for the past twenty-four hours, and examination showed that it came from the middle meatus, into which the fronto-nasal canal drains. Three days later she called again. The conjunctiva had entirely cleared up; the fundus had its normal red color throughout; the grayish exudate was entirely absorbed; the choroidal vessels which had been hidden

by the exudate were visible; vision was better than $10/10$, and the accommodation range normal.

This case of choroidal exudate and incipient iritis and cyclitis (hyperæmic condition), accommodative loss showing ciliary involvement, received absolutely no other treatment, internal or otherwise—nothing was done except draining the frontal sinus. The patient informs me that she now uses her eyes with comparative comfort; that there has been no return (November 20th) of the former attacks of ocular congestion, though she has been inconvenienced occasionally by close application. A single drainage in chronic sinusitis is not expected to cure, but it did relieve the exacerbation and resultant ocular symptoms.

This case is interesting, as it is the first one reported of retinal detachment cured by treating an accessory sinus. Only two other cases of detachment with similar aetiology have been published, one by Kuhnt (*Über die entzündlichen Erkrankungen der Stirnhöhlen und ihre Folgezustände*, Wiesbaden, 1895, Case XVII, discussion, p. 120) of unilateral frontal sinusitis, with uveitis, opacities in the vitreous, retinal detachment and a great loss of vision, on same side, in a syphilitic patient. After the subsidence of the stormy symptoms (of the sinusitis), the opacities and detachment persisted with nearly total blindness; vision equaled fingers counted at one metre distance in the lower half only of the visual field. Although the vision was previously good and the nearly total loss was sudden and followed closely on the acute attack of sinusitis (frontal pain, œdema of the lid, ptosis, etc.), still he looked on the acute sinus attack only as a possible causal factor, considering the uveitis, detachment, etc., to be due to the transference to the uveal tract of infected matter from the sinus, rather than to a venous stasis, although the lid œdema and subretinal serous exudate indicated a local circulatory disturbance. The second case was published by Broeckaert (*Révue de Laryngologie*, 1901, p. 14). Woman, 62 years old, with a chronic ethmoido-frontal empyema. L. eye: cornea, pupil and iris normal. Fundus very obscure, owing to abundant moving opacities in the vitreous. Severe pain in the head. No syphilis or renal trouble. R. eye normal. Patient was given K. I. merc.

inunct. and rest: but the condition became much worse, the media less transparent and vision further reduced, fingers at 20 cm. Difficult nasal breathing directed attention to the nose, and examination revealed the middle meatus full of polypi and fungus masses bathed in pus. For the past two years there had been an occasional foul discharge. After removing these masses from the middle meatus, pus was seen coming from the frontal and ethmoidal sinuses. Soon after, the vision improved, the media became clearer and retinal detachment could be diagnosticated in the inferior part of the fundus. Radical operation (Luc) of the frontal and ethmoidal cells, and later on another ethmoidal cell was opened. The pus discharge from the cavity ceased, the media cleared up, but the detachment persisted. The vision improved to normal in the upper part only of the retina. Lower half amaurotic.

Wessely (Berl. Ophthal. Soc., March, 1904, *Ophthal. Record*, p. 380) from results obtained in producing artificial detachment, comes to the conclusion that exudate from the choroid may, after all, be the only cause of idiopathic detachment of the retina; and the very interesting paper of Mme. Dr. Gourfein-Welt, "De la pathogénie du décollement rétinien dans la rétinite albuminurique" (Ire. Livraison du Recueil des Travaux, p. 33), at the recent International Congress, substantiates the choroidal exudate hypothesis. I quote one of her conclusions: "In detachment in albuminuric retinitis the homogenous subretinal exudate comes from the choroid and is nothing more or less than a hydropic accumulation behind the retina identical with œdema in any other organ."

A seventh case of internal eye disease due to a frontal sinusitis will be published later; abundant opacities in the vitreous and marked and rapid reduction of the vision, less than $\frac{1}{10}$, weeks before. One week after syringing the cavity the vision improved to $\frac{1}{4}$, with resumption of the daily occupation, and three weeks later ability to read the paper "as good as ever."

Uveal tract inflammation resulting from sinus disease was first demonstrated by Ziem (*Centralblt. f. prakt. Augenheilk.*, 1889, p. 358; *Berl. Klin. Wochenschr.*, 1890, No. 36, p. 819;

Wiener Klin. Wochenschrift, 1892, Nr. 29, p. 418; and *Annales des Maladies de l'Oreille*, 1893, Nr. I), and later on our knowledge of this subject was added to by Kuhnt. While Ziem believes in a direct causal relation between the two, Kuhnt will only admit its possibility or at most regards sinus disease only as a predisposing factor, favorable to the development of uveitis. Although he often saw the two coexist, and the ocular lesions improve on treatment of the affected cavity, and although he says (p. 112) "I am satisfied that they (internal diseases) are caused by inflammatory conditions of the nose and sinuses much oftener than is generally supposed, but oftener by far, however, are the predisposing conditions, not only for the induction of these diseases but also the reason of their chronicity, brought about by a passive hyperæmia, in regard to which I fully agree with the views of Ziem," still he does not unreservedly grant the relation of cause and effect, as witness the following quotations, (p. 116): "I have never seen a case of simple cyclitis, presenting the typical symptoms and course, due solely to an empyema of the frontal or the other pneumatic cavities." "The proof of an actual relation, and that only, and not a mere coincidence, the two diseases resulting from the same cause, could not be established with certainty." He also holds the same views in regard to choroiditis. Hajek (*Pathologie und Therapie der Entzündlichen Erkrankungen der Nebenhöhlen der Nase*, Leipzig, 1903, p. 317) states that Kuhnt never saw a case of iritis, for instance, definitely cured by treatment of the sinusitis, and in Ziem's case, where such a cure is claimed he (Kuhnt, p. 112) questions it on three grounds, viz., the uncertainty of the diagnosis of frontal sinusitis, the fact of the patient having gonorrhoea which could have caused both the iritis and sinusitis, and finally, that the therapy used, besides the cleansing of the cavity (packs, sweats and jaborandi) was itself capable of curing the iritis.

Anticipating the second objection, Ziem states in the case history that the patient had been free from gonorrhoea for several years and refers to Jacobson who says in regard to iritis gonorrhoeica (*Beziehungen der Veränderungen und Krankheiten des Sehorgans zu Allgemeinleiden und Organer-*

krankungen, Leipzig, 1885, p. 84), "both eyes, one after the other, are always affected, relapses are frequent, and it is always accompanied by an arthritis gonorrhoeica," which symptoms, Ziem says, were absent in his case. None of these objections, however, can be made in my case No. IV, as there was no infection of any kind. The diagnosis cannot be questioned—intense pain, the frontal bone over the sinus exquisitely sensitive to the slightest touch, the œdema of the lids, the conjunctival and ciliary injection and the profuse typical nasal discharge, which, when once established, gave immediate freedom from the severe symptoms, followed by gradual relief of the others; and as to the part taken in the cure of the iritis by the additional therapeutic measures—packs, sweats, atropine and potassium iodide—I think it was insignificant in comparison to the drainage of the sinus: and this auxiliary treatment, a thorough depletion, besides a possible beneficial effect on the iritis itself, is, next to probing and syringing, the mode of treatment best adapted to establish the drainage of the cavity. These remedies, with the exception of the atropine, were not employed early, not until I failed to establish an immediate flow, and they probably would not have been used at all if I had been successful. But had I succeeded in opening the canal at once, before the appearance of the synechiae, the positive evidence of the iritis, the diagnosis of iritis could have been questioned. It is true the iris was darker in color and sluggish, as in Cases V and VI, but earlier drainage of the sinus would doubtless have aborted the inflammatory condition in the iris, as I think it did in the other two cases, it would not have gone on to the formation of synechiae. Viewing this case wholly from the standpoint of cause and effect, I consider it to be practically identical with the other two, a uveal tract affection due to venous stasis caused by frontal sinusitis and cured by drainage.

Many cases of internal eye disease in connection with sinusitis have been reported, the majority of them described in an able monograph by Eversbush (*Graefe-Saemisch Handbuch der ges. Augenheilk.*, T. II, B. IX, K. XVI). The earliest recorded case is by Welge in 1786 (cited by Berger and Tyrman, *Die Krankheiten der Keilbein-Höhle und des*

Siebbein-Labyrinthes und ihre Beziehungen zu Erkrankungen des Sehorganes, Wiesbaden, 1886, p. 18). Other cases have been published by Bethune (*Boston Med. Surg. Jour.*, 1850, p. 179), Ressel (*Allgem. Wiener med. Zeitung*, 1860, 8 and 10), Richet (Thèse Sautereau. Etude sur les tumeurs de la glande lacrymale, Paris, 1870, p. 68), Horner (*Klin. Monatsblt. f. Augenheilk.*, Feb. 1863), Rouge (*Union méd.*, XIII, p. 163), McNaughton Jones (*Dublin Jour. of Med. Science*, Sept., 1873, p. 205), Duplay (*Arch. gén. de Med.*, 1874, p. 82), Russell (*Medical Times and Gazette*, June, 1878, p. 614), Knapp (*Archiv f. Augenheilk.*, 1880, p. 448), Huguenin (*Correspondenzbl. f. Schweizer Aerzte*, 1882, p. 103), Borthen (*Graefe's Archiv f. Ophthal.*, B. XXXI, H. IV, p. 241), Redtenbacher (*Wiener med. Blätter*, 1892, p. 200), Raymond (*Bull. Soc. Anat.*, 1885, p. 226), Demarquay (cited by Mackenzie, Diseases of the Throat and Nose, 1884), Snellen (Ref. in *Centralblt. f. Laryn. Rhin. und verw. Wissenschaften*, 1894-95, II, p. 335), de Lapersonne (*Presse. méd.*, Mai, 1898), Fliese (*Wiener klin. Rundschau.*, 1895, p. 65), Hoffmann (*Verhandl. d. Deutsch. Otol. Gesel.*, VI, Vers. 1897), Coppez and Lor (*La presse méd. Belg.*, 1900, No. 1), Bourgeois (*Ophth. Klin.*, 1900, 18 and 19), Mann (*Verhandl. d. Deutsch. Otol. Gesel.*, 10 Vers. 1901, p. 199), Halstead (*Am. Laryn. Rhin. and Otol. Soc.*, 1901, p. 61), Kuhnt (*l. c.*, p. 141), Guttman (*Centralblt. f. Augenheilk.*, 1899, p. 299), Panas (*Archiv. d' Ophthal.*, X, Jan., Feb., 1890, p. 231), Trantas (*Archiv. d' Ophthal.*, 1893, p. 358), Fromaget (*Annal. des maladies de l'oreille et du larynx*, 1894, p. 871), Coppez and de Lautsheere (*Ophth. Klin.*, 1902, No. 23), Axenfeld (*Deutsch. med. Wochensch.*, 1902, p. 715), Brandt (*In. Diss. Freiburg*, 1902), Grüning (*Trans. Am. Med. Assoc.*, 1903, p. 175), Nordquist and Pihl (Ref. in *Hygiea*, Dec., 1901), Collins and Eymeri (*Anal. d'oculist.*, CXXIII, p. 361), Nieden (*Archiv. f. Augenheilk.*, B. XVI, 1886, p. 381), Hajek (*l. c.*, p. 241), Polyak (*Frankel's Archiv f. Laryn. u. Rhin.*, 1904, p. 340), Calderaro (*La Clinica Oculist*, 1903, p. 1161 (?)).

All of these cases, however, are very different in their clinical course from the above described cases. Without exception, they present one or more of the classical symptoms

of an empyema, as perforation of a cavity wall with fistula, orbital abscess or cerebral complication according to the location of the perforation, orbital tumor, exophthalmus, great œdema, polypi and pussy secretion by nasal examination, etc.

One word in regard to Ziem's theory of a passive orbital venous stasis. The reason I prefer his hypothesis to that of an absorption of infected matter from the cavity, is the fact that we get quick relief from the symptoms on draining the sinus. I have seen evidences of this venous stasis disappear, in some cases within twenty-four hours, in others in the course of three or four days, when present in the form of an œdema in the lids and neighboring parts, conjunctival injection, a chemosis, enlarged ciliary veins, sluggish pupil, engorged ciliary body, reddened disc, a general œdematous condition of the fundus, a subretinal exudate and a cellulitis with exophthalmus. An inflammation within or about the globe, due to the absorption of toxins from a neighboring cavity, would not so readily and quickly vanish. Apropos is a case I published in *The New York and Philadelphia Medical Journal*, February 27, 1904. A young man, emmetropic with double frontal empyema of two years standing, whose sinuses I was washing out every day, complained one morning of pain in the left eye following near work. The lower lid and tissues under it, normal the day before, were red and œdematous. He was positive that this was the first appearance of either the asthenopia or œdema. Nasal examination revealed the hitherto constant and visible stream of pus absent on the left side. A thickened clot had dammed up the fronto-nasal canal. The secretion, shut up but a few hours, had caused venous stasis and an accommodation paresis. Re-establishment of the flow by syringing the cavity resulted in immediate relief of all the symptoms as reported at the next visit.

There are several points worthy of notice in the above six cases.

(1) The negative history of the patients, the absence of any and all constitutional trouble or toxic diseases that are usually sought for when trying to determine the etiology in these obscure cases. With the exception of an occasional rheumatic attack, complained of by one of them, they were

all strong, healthy individuals, and the real cause of the intra-ocular involvement in every case was a simple mechanical condition, the damming up or closure of the fronto-nasal canal. The question arises, if these patients had been syphilitic, rheumatic or gouty, would the aetiology have been determined? Furthermore, in my opinion an unrecognized sinusitis is the real cause of the ocular lesion in a certain proportion of the cases attributed to syphilis, as the latter is acknowledged by all writers to be a frequent aetiological factor of sinus disease.

(2) The presence of a sinusitis, where (a) severe, constant pain, considered a *sine qua non*, was absent (cases I and II), and where (b) the nasal examination in each one of the above cases, unless made with the greatest care, would have been negative as far as a sinusitis was concerned, the classical symptoms were wanting. In not one of them was there a nasal secretion. Cases with negative nasal examination have been reported by Farlow (*Am. Laryn. Assoc.*, 1898), Brandt (*l. c.*, case VII, p. 46), Axenfeld *Monatsbl. f. Augenheilk.*, 1904), Schmiegelow (*Archiv f. Laryn. u. Rhin.*, 1904, p. 267), and others. As a striking illustration I will briefly cite the following case. Young man, age 24, who had used with comfort the constant convex glasses I had given him a year before, and with which each P. P. was 12 to 13 cm., complained a few months ago of photophobia, asthenopia and "red eye," for the preceding ten days. The pupils were sluggish, inability to use his eyes for near work indicated an accommodation paresis, and the bulbar, and especially the palpebral conjunctiva, was chemotic; it did not look like an ordinary catarrhal inflammation, there was no secretion but rather a dry, hot appearance, resembling raw beef, a puffy, velvety look or condition in which the individual capillaries could not be distinguished. Astringents and protargol were used daily for a week or more without result. I thought possibly that the œdematous condition might be due to a sinusitis, and two or three times I made pressure and percussion under and over the frontal sinuses, but with absolutely negative results. On one occasion I examined his nose, without applying any astringent, and found each middle turbinate, as well as the entire upper passage, plainly visible

and perfectly normal in appearance, so I did not even touch the parts. Furthermore, he did not have the dull, heavy feeling in his head, so often present. Same treatment continued. Three or four days later he said he had the pains I had been looking for, but I told him it was only suggestion, but on slight percussion or pressure over the sinuses there was marked tenderness, and syringing them brought a profuse muco-purulent secretion. In three days the chemosis was gone and soon after the other symptoms disappeared also.

(3) The affection of the pupil and accommodation. These symptoms are common in sinus patients. Accommodation paresis especially is an early and almost constant symptom of latent sinusitis. Ziem (*Berlin klin. Wochenschr.*, 1889, p. 833) and Caldwell (*N. Y. Med. Journal*, 1898) have noted it and I have seen the range reduced to $\frac{1}{2}$, $\frac{1}{3}$ and even $\frac{1}{4}$ the normal (*New Orleans Med. and Surg. Jour.*, Feb., 1904, *N. Y. and Phila. Med. Jour.*, Feb. 27, 1904, and *Ophthalmology*, Vol. I, p. 16). By reason of this, should a patient with unilateral irido-cyclitis from any cause, or with an old foreign body in one eye, have certain symptoms in the other, due to a sinus affection, the condition could easily be wrongly diagnosed as one of sympathetic irritation or inflammation, according to the character of the symptoms. Ziem (*ibid.*, p. 857) who has studied the intimate causal relation between these two conditions possibly more than any ophthalmologist in Germany, has reported a case of the first category where enucleation was performed "to save the other eye," and I have a case of the second kind to publish, where an eye, perfectly quiet according to the patient's statement, was enucleated, but not before it was advised by five different ophthalmologists.

(4) The symptoms of latent or closed sinusitis manifest themselves about the eye, hence the patient visits the oculist rather than the rhinologist; but if it is a patent or open empyema, with free drainage and profuse nasal discharge, there are usually no eye symptoms, and he consults the rhinologist. That fact explains why the ocular symptoms are not prominent in the text-books on rhinology, as well as the common failure of the ophthalmologist to recognize this con-

dition; he looks to the rhinologist for the symptomatology.

(5) The frightful trigeminal pains in Cases IV, V and VI, like those so often accompanying an iritis or other internal ocular inflammation, disappeared immediately on draining the sinus; they were caused by the sinusitis and not by the ocular affection. (In Case IV, the inflammation, equally severe immediately after the establishment of drainage and subsiding several days thereafter, caused no iritic pains or "ciliary neuralgia.") May we not then reasonably infer that these same pains, often "so out of proportion to the amount of inflammation present," as well as the ocular trouble itself, are often due to an unrecognized inflammation of one of the accessory sinuses?

(6) As to the frequency of uveitis from accessory sinus disease, I will only state that the above cases were not selected from a vast clinical material, but represent seven out of eight consecutive cases of internal eye trouble in my private practice.

In conclusion, I think that if we examined carefully the condition of the pneumatic cavities in all cases of iritis, cyclitis, choroiditis, etc., we would determine the aetiology oftener, spare our patients the excruciating, sleep-robbing pain and get far better results.

ADDITIONAL LITERATURE.

Guillemain. Etude sur les abcès des sinus frontaux considérés principalement dans leurs complications orbitaires, leur diagnostic et leur traitement, *Arch. d'Ophthal.*, Jan., Feb., 1891.

Berger. Rapports entre les maladies des yeux et celles du nez et des cavités voisines, Paris, 1892.

Bryan, *Journal Am. Med. Assoc.*, vol. xxxiii, No. 20.

Wertheim, *Archiv f. Laryn. u. Rhin.*, 1901, B. xi, p. 169.

Lermoyes, *Annal. des mal. de l'oreille et du larynx*, 1902, p. 369.

Winckler, *Fortschr. auf dem Gebiete der Röntgenstrahlen*, 1903, v.

Onodi, *Zeitschrift f. Augenheilk.*, July, 1904.

HIGH DEGREE OF HYPERMETROPIA.

BY DR. S. C. AYRES.

CINCINNATI.

IN March, 1877, I examined Mrs. H., who was suffering from asthenopic symptoms. Up to this time she had never worn glasses and had had trouble in reading and sewing. There was recorded in my notes some "insufficiency of the interni." Sight without glasses in either eye was only $\frac{5}{100}$ with + 13 D. $V = \frac{5}{50}$. + 13 was ordered for constant use. In two months she returned, as the lenses were not entirely comfortable, and I then found that with + 12 D. she had $V = \frac{5}{40}$ in either eye. These were ordered for constant use. I did not see her again until August, 1903, twenty-six years after the first examination. I found her wearing for distance + 18 D. and she had been wearing glasses as strong as these for several years.

She had cortical cataract in the right eye far advanced, so that sight was reduced to counting fingers at six feet, but perception and projection were good.

In the left eye she had incipient cortical cataract, but with + 18 D. $V = \frac{15}{200}$.

In my experience this is an exceptionally high degree of hypermetropia.

MANUAL AND ATLAS OF MEDICAL OPHTHALMOLOGY. By SIR W. R. GOWERS and MARCUS GUNN. 4th Edition. Philadelphia, P. Blackiston's Sons & Co. 1904. Price \$4.00.

Gower's well known and excellent treatise on medical ophthalmology needs no praise. This new edition has some valuable additions. It seems, however, that regarding the histological illustrations much remains to be desired and could be improved upon. They do not compare with the excellent ophthalmoscopic pictures.

MEDICAL SOCIETIES.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.*

JOHN TWEEDY, F.R.C.S., President, in the Chair.

Thursday November 10th, 1904.

TUMOR ENVELOPING THE OPTIC DISC.

MR. SIMEON SNELL (Sheffield) related a case of intraocular tumor occurring in a farmer aged 37. He was first seen last February, and a month previously he had discovered loss of sight in his right eye. He could see fingers indistinctly. An opaque mass covering the optic disc was discovered. When first seen it was more cyst-like and less solid than later on. The family history was good. After a few weeks the patient disappeared, and was not seen again till the beginning of August, by which time the mass had become considerably larger. It was large and nodular, and about $2\frac{1}{2}$ disc diameters in size, somewhat circular in form, and completely hid the optic disc from view. The most prominent part could just be seen with + 11 D., but there was an area close to this which could be best seen with + 6 D. and the macular region with + 2 D. The diagnosis made was that of a tumor growing from the disc or in its immediate neighborhood. The eye was enucleated at the end of August and the nerve was removed as far back as possible. Close to the outer side of the nerve sheath was a small black nodule the size of a pin's head. Mr. Treacher Collins examined the eyeball and reported that at the posterior pole was a melanotic growth. Its base was 7 mm. in length, and extended from the choroid about the optic disc to a point a little lower than the center of the disc.

SARCOMATA OF THE CHOROID.

MR. HERBERT PARSONS read a paper on Anomalous Sarcomata of the Choroid. Six cases were demonstrated by means of lantern slides. Case I was an ordinary melanotic sarcoma

*British Medical Journal.

of the choroid in the third stage, the extraocular extension being unpigmented. The patient died a year after removal of the eye, and was found to have secondary, bile-stained, spindle-celled sarcoma of the liver, and squamous-celled carcinoma of the ribs, lung, and mediastinal glands. Cases II and III were almost identical in appearance and general character. They contained very necrotic, round, angio-sarcoma of the choroid. There was extensive necrosis of most other structures of the eye. Case IV had an extraordinary family and personal history: The mother and younger sister had each had an eye removed at Moorfields for sarcoma of the choroid, and the patient had had her breast removed for a tumor. There were two small melanotic sarcomata of the ciliary body and anterior part of the choroid, and a large, bilobed necrotic angio-sarcomatous mass springing from the choroid posteriorly. The other structures of the eye were necrotic and there were many haemorrhages. Cases V and VI were necrotic angio-sarcomata, springing from the choroid at the posterior pole of the eye. The other structures of the eye were also necrotic. The points specially insisted upon were as follows: The similarity of the growths microscopically to organized blood clots and their apparent origin in the retina—an appearance which was demonstrated to be erroneous; the varying occurrence of haemorrhage, the importance of not overlooking sarcoma of the choroid in cases of severe intraocular haemorrhage (cf. Verhoeff), and the relation of the haemorrhage to the necrosis, whether as cause or result, both probably occurring; the necrosis, its dissimilarity from the patches of necroses in ordinary sarcomata, its universality, not only throughout the tumors but also in other parts of the eye. The deductions made were that the necrosis was not due to a preliminary irido-cyclitis (cf. Leber and Krahnstöver), was not due to thrombosis and only partially to haemorrhage; it was probably due to endogenous microbic infection, essentially by means of toxins universally distributed throughout the eye by the intraocular fluids. The theory was comparable with the most probable theory of sympathetic ophthalmia—namely generalized endogenous infection by invisible organisms (cf. Romer). It explained the marked inflammatory reaction sometimes seen outside the

eye. The growths were probably of low malignancy, on account of their genesis, their necrotic condition, and the thrombosis of the vessels. If, therefore, they were not excised, they would shrink and become examples of shrunken globes containing choroidal sarcomata. Further, they were an early stage of this small group, a stage which had not before been described. That the eyes would inevitably shrink was shown by the albuminous constitution of the intraocular fluids, which would lead to diminished filtration and stasis; moreover, the universal necrosis must lead to shrinkage. The growths were also identical in type with those previously found in shrunken globes (cf. Leber and Krahnstover). Such tumors probably were frequently overlooked, owing to their great resemblance to intraocular blood clots. They were of great practical importance from the point of view of prognosis, and especially in point of theory, since they marked a stage which had previously escaped observation in the life-history of a group of sarcomata.

PAMPHLETS RECEIVED.

“On the Horopter,” by Geo. T. Stevens, M.D.

“Annual Report of the Surgeon-General for the Year 1904.”

“Eye Strain and Its Consequences,” by A. Maitland Ramsay, M.D.

“Poisoning by Wood Alcohol. Cases of Death and Blindness from Columbian Spirits and other Methylated Preparations,” by F. Buller, M.D., and Casey A. Wood, M.D.

BOOK REVIEWS.

ENCYCLOPÉDIE FRANCAISE D'OPHTALMOLOGIE. Edited by
PROF. F. LAGRANGE and D. E. VALUDE. Vols. I, II and
III. Paris, Octave Doin, 1904.

A magnificent encyclopædia of ophthalmology, arranged somewhat like the German encyclopaedia of Graefe-Saemisch. The exhaustive character of the treatment of the several subjects by authors most fit to do justice to their special branch, the thoroughness and the multitude of excellent illustrations, make this encyclopaedia a most excellent addition to the oculist's library.

The three volumes received contain articles on the history of ophthalmology, anatomy and physiology of the eye and its adnexes, embryology, teratology, comparative anatomy and physiology, optics and refraction.

THE PATHOLOGY OF THE EYE. By J. HERBERT PARSONS.
Vol. I, Histology. Part I. New York, G. P. Putnam's
Sons. 1904. [London, Hodder & Staughton.]

This is the first of four volumes in which Dr. Parsons, well known as curator at Moorfield, with its immense material proposes to treat on the whole subject of pathology of the eye. If the following volumes will be of the same excellence as this first one, and there is no reason to doubt it, the work will be one of great merit and should be widely studied. The 267 illustrations are mostly from the author's photographs, and while not always clear enough for the uninitiated, any one with some familiarity with the microscopical appearances of the tissues of the eye, will readily understand them.

The lack of completeness of the literature the book shares with most modern ones. This is the more pardonable, as the papers grow daily more numerous and are published in innumerable journals.

We await with great interest the further volumes of this excellent work, which every ophthalmologist should have in his library.

REFRACTION AND HOW TO REFRACT. By JAMES THORINGTON, A.M., M.D.. 3rd Edition. 250 illustrations. Philadelphia, P. Blackiston's Sons & Co. 1904. Price \$1.50.

This thoroughly useful book is somewhat enlarged in this, its third edition, and recommends itself to the student without further praise.

SURGICAL ANATOMY OF THE HEAD AND NECK. By JOHN B. DEEVER, M.D., Philadelphia, P. Blackiston's Sons & Co. 1904.

This beautiful treatise contains two chapters of great and special interest to the ophthalmologist, one on the orbit and one on the eye, besides much that will be of value to him in the other chapters. The illustrations are very fine and in some ways original. The descriptions are clear and to the point.

PRECIS DE THEREPEUTIQUE OCULAIRE (ocular therapeutics). By DR. SCRINI, with a preface by Prof. de Lapersonne. Paris, G. Steinheil. 1904.

This book, dedicated to the memory of Prof. Ph. Panas, reflects this master's views on ocular therapeutics as interpreted by Scrini, his pupil. It is undoubtedly of great usefulness to students.

SYPHILIS DE L'OEIL ET DE SES ANNEXEN (Syphilis of the eye and its adnexes). By DR. F. TERRIEN. Paris, G. Steinheil. 1904.

A very complete treatise on syphilis as it may affect the tissues of the eye, its nerves and motor apparatus, with some good ophthalmoscopic plates in black and white. The chapter on treatment seems to be of especial value with its detailed description of subcutaneous, intramuscular, and intravenous injections of mercury, etc.

EYE-STRAIN AS A CAUSE OF HEADACHE AND OTHER NEUROSES. By SIMEON SNELL. London, John Bale, Sons & Daniels-son. 1904. Price 2, 6 shilling.

A reprint of a somewhat revised article on this interesting subject, formerly published in *The Lancet*. It is full of practical hints.

SURGICAL TREATMENT OF BRIGHT'S DISEASE. By G. M. EDEBOHLS. New York, F. F. Lisiecki. 1904. Price \$2.00.

The author, who has introduced the operation of decapsulation of the kidney as a treatment of Bright's disease, gives here an objective review of his cases and agrees that the operation, while undoubtedly promising, is still on trial. Bright's disease being so often the cause of severe eye affections, this book should prove very interesting reading to ophthalmologists.

DIE AUGENAERZTLICHEN OPERATIONEN (Operations on the Eye). By D. W. CZERMAK. Parts XVI and XVII. Wien, K. Gerolds Sohn. 1904.

These parts contain further details concerning cataract operations, given in the same excellent manner as we have noted about the preceding parts of this monumental work.

THE PRINCIPLES OF REFRACTION IN THE HUMAN EYE, BASED ON THE LAWS OF THE CONJUGATE FOCI. By SWAN M. BURNETT. The Keystone, Philadelphia. 1904. Price \$1.00.

Our readers are acquainted with this practical and clear exposé, so beautifully illustrated with original drawings by Ch. F. Prentice. As a text-book for students it is advisable and will undoubtedly be welcomed in such a more lasting form.

THE OPTICAL DICTIONARY. By CH. HYATT-WOOLF. Philadelphia, P. Blackiston's Sons & Co. 1904.

A handy little dictionary for the student, which would be more valuable if it was not for a great many mistakes in spelling and wrong definitions, as for instance: "Dacryocystoblennorrhœa. Flow of tears from the lachrymal sac.

ALT.

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